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# MONTANA

## HIGHWAY COMMISSION



1971 REVISIONS TO 1969  
STANDARD DRAWING BOOK  
FOR ROAD AND BRIDGE CONSTRUCTION

MONTANA STATE LIBRARY  
930 East Lyndale Avenue  
Helena, Montana 59601

EFFECTIVE JAN. 1-1971

BIG SKY COUNTRY

АНАТОМИЧЕСКАЯ  
КОМПОЗИЦИЯ  
ХУДОЖЕСТВА

Составил  
Юрий Григорьевич  
Лебедев — художник-живописец

Издательство «Художественная литература»

Москва — Ленинград — Баку — Тбилиси

1978 год — 1-е издание — 1000 экз.

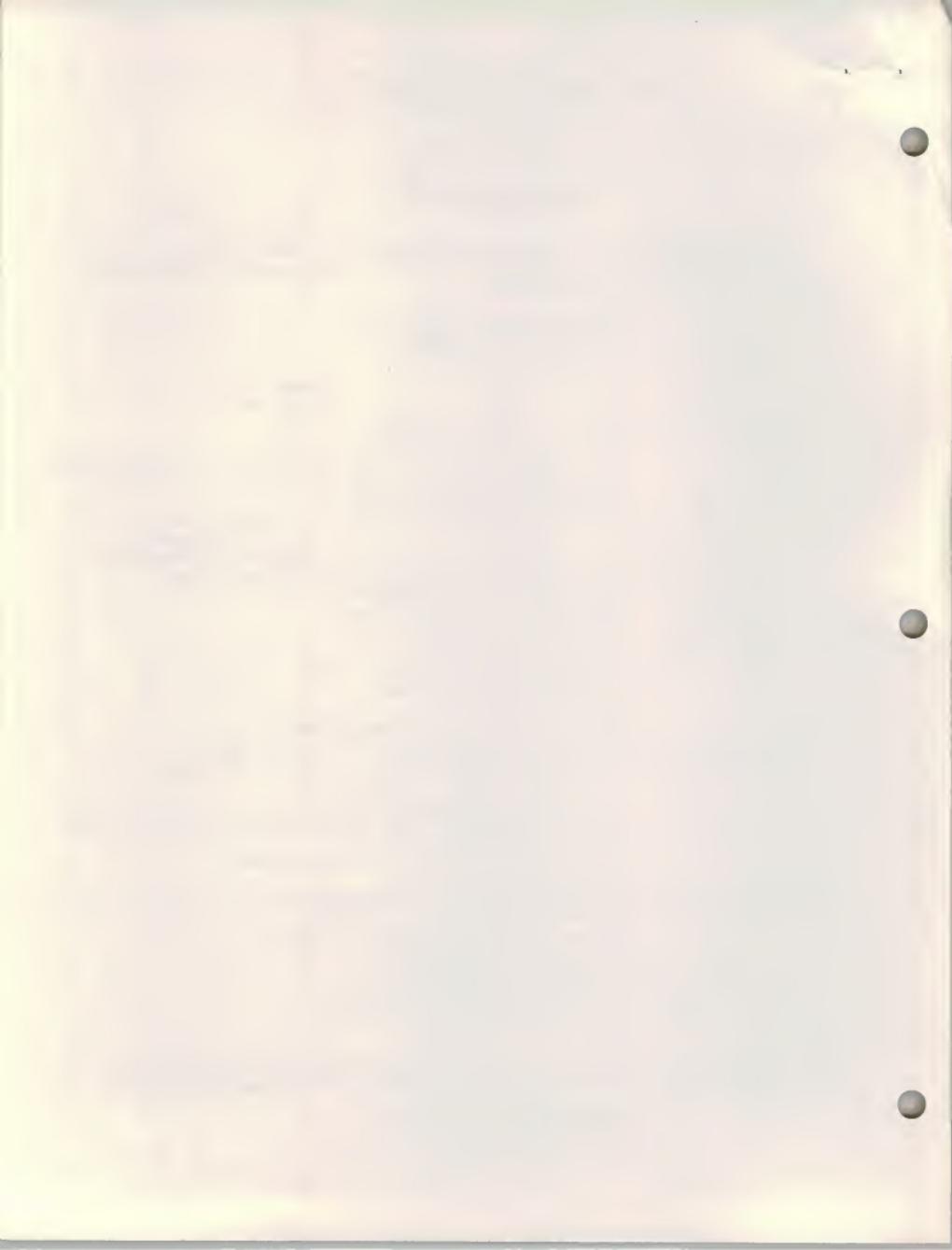
STATE HIGHWAY COMMISSION  
HELENA, MONTANA 59601

JANUARY 1, 1971

STANDARD DRAWING BOOK

We are sending the following additions and/or revisions effective January 1, 1971 to be included in your present Standard Drawing Book, the grey covered one, original issue January 1, 1969.

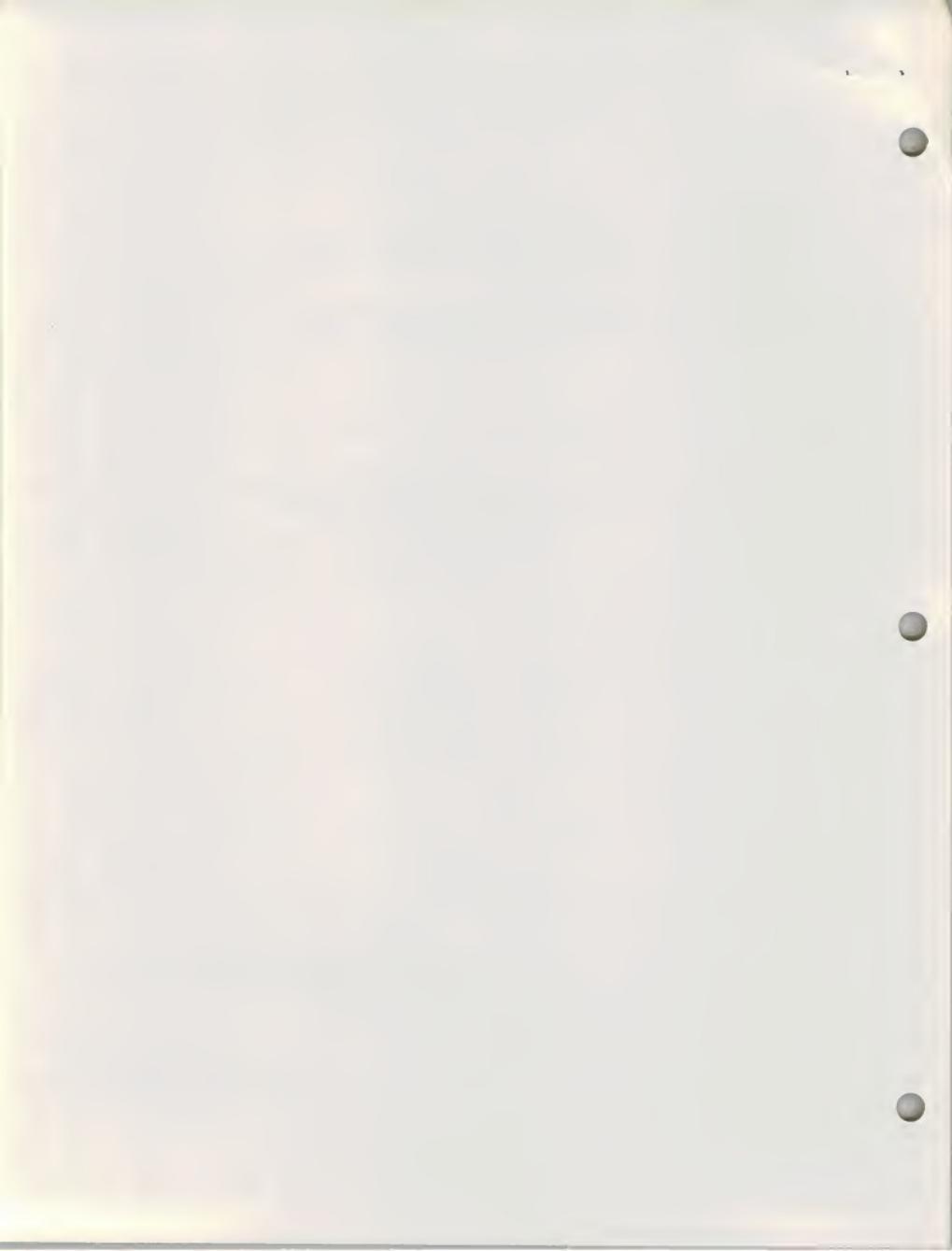
50-20A	Concrete Slope Protection
50-20B	Concrete Slope Protection
50-20C	Concrete Slope Protection
50-21A	Concrete Slope Protection - Alternate II
50-21B	Concrete Slope Protection - Alternate II
54-01	R. C. P. Culvert Bedding
54-06	R. C. P. & S. P. P. Culvert Bedding
56-01	Fill Height For C. S. P. H-20 Loading 2 2/3 x 1 1/2 Corrugations
56-02	Fill Height For C. S. P. H-20 Loading 3 x 1 Corrugations
56-10	Embankment Protector
57-00	Fill Height For C. S. P. Arch 3 x 1 Corrugations
57-01	Fill Height For C. S. P. Arch 2 2/3 x 1/2 Corrugations
59-00	Fill Height For C. S. P. H-20 Loading 6 x 2 Corrugations
59-01	Fill Height For C. S. P. Arch 6 x 2 Corrugations
81-01	Wire Fence - Interstate Type
81-02	Wire Fence - Interstate Type
81-03	Farm Fence
88-07	Standard R2-12 Sign
88-09	Signing of Median U-Turns
88-16	Standard W4-2 Warning Signs
88-18	W6-4A & W6-4B
88-19	W8-9, W9-2, W9-5 & W9-6 Warning Signs
88-28	Secondary Route Marker For Use on Guide Signs
88-36	Typical Guide Sign Layout
88-37	Informational Signs - Services
88-37A	Informational Signs - Rest Area
88-38	Standard N6-2 Stream Name Sign Primary and Secondary Routes
88-39	Weigh Station Signs
88-47	Standard Rest Area and Information Signs
88-57	Typical Sign Erection
88-58	Typical Crossroad and Ramp Layout
88-66	Standard Guide Signs
88-68	Aluminum Sheet Increment Guide Signs
88-70	Guide Sign Mounting Details
88-72	Railroad Crossing Signs
88-74	Xl-1 Sign and Erection Detail
88-75	Typical Pipe Post Mounting Detail
88-76	Wood Pole Slot Detail
88-77	Typical Sign Erection
88-78	Typical Route Marker Assembly with Treated Timber Post
88-92	Delineator Spacing For Horizontal Highway Curves
90-00	5 in. Wood Guide Post
90-02	Metal Guard Rail
90-03	Metal Median Rail



90-04	Bridge End Treatment
90-05	Guardrail Terminal Sections - Sheet 1
90-06	Guardrail Terminal Sections - Sheet 2
90-07	Pier Treatment
90-08	Reflector Washer
90-14	Guardrail for Grade Crossing Protection
100-13	Historical Marker

- NOTE:
1. Add these drawings to your book.
  2. We are also sending a complete new index, pages 1 thru 8.  
You should destroy the old index Pages 1 thru 6.
  3. Note several drawings have been deleted as of January 1, 1971.

*Melvin C. Rygg*  
MELVIN C. RYGG, P. E.  
OFFICE ENGINEER



January 1, 1969  
Revised April 1, 1970  
Revised January 1, 1971

STATE HIGHWAY COMMISSION  
HELENA, MONTANA 59601

STANDARD DRAWINGS FOR HIGHWAY CONSTRUCTION

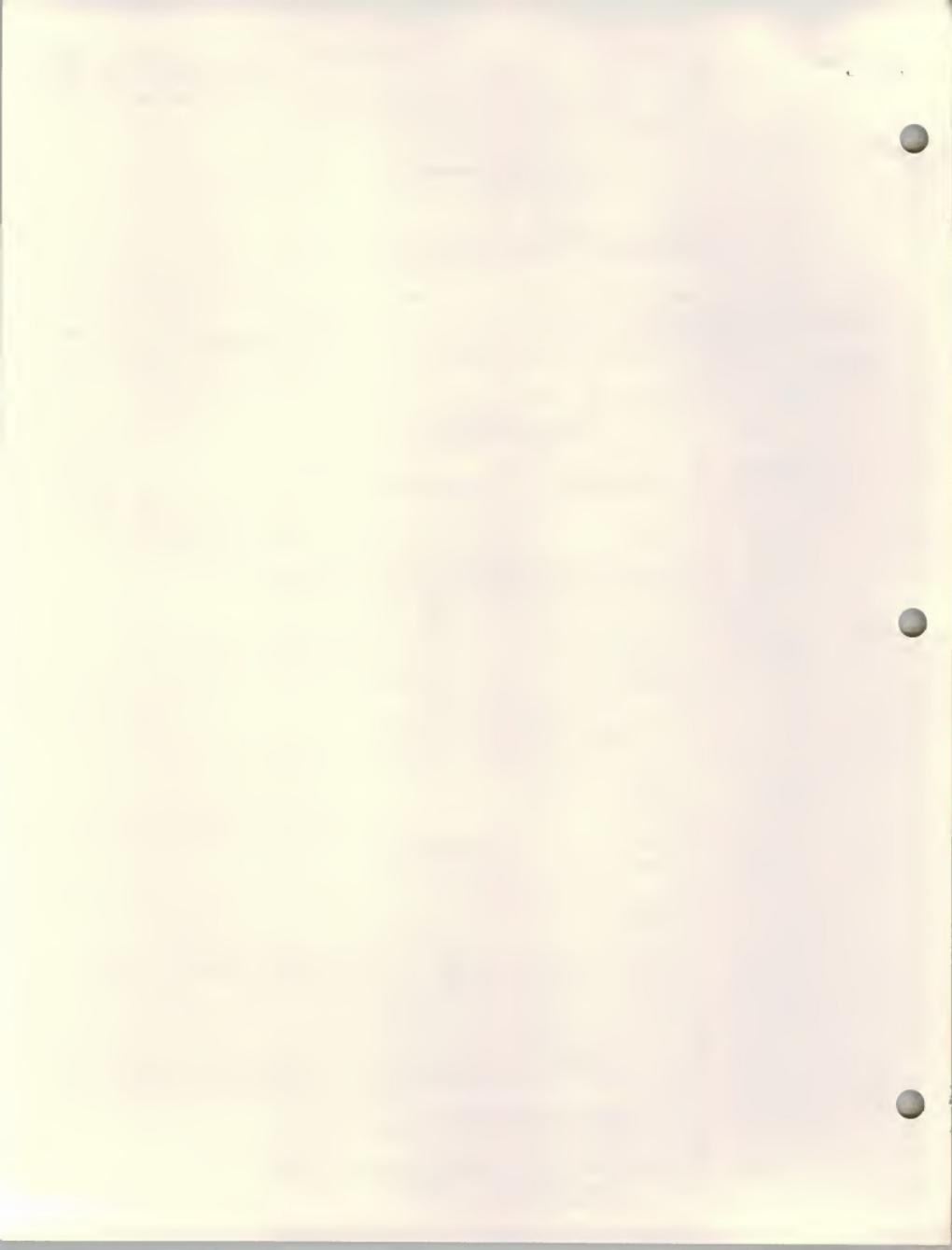
These Standard Drawings which are supplementary to the Standard Specifications become effective January 1, 1969.

In the future when revised drawings are sent, they will become effective on the date shown thereon and the superseded drawings should be retained until no longer applicable.

New drawings issued will become effective on the date shown thereon.

TABLE OF CONTENTS

06-01	Gravel Pit Markers
06-10	Grading Rules for Timber Posts
07-01	Construction Sign CSSR
07-03	Construction Identification Signs - CIS-1 & CIS-2
07-03	Revised Effective 7-1-69
07-08	Signing and Marking Bridge Ends and Obstructions
11-01	Furrow Ditch, Ditch Block and Sign Island
11-02	Slope Rounding
11-03	U-Turn Median Openings on Controlled Access Highways
11-04	Roadway Embankment at Bridge End
	Added Effective 7-1-69
	Revised Effective 1-1-70
	Revised Effective 4-1-70
12-01	Haul or Overhaul
12-02	Haul or Overhaul
12-03	Haul or Overhaul
13-01	Measurement of Roadway Rolling
13-02	Measurement of Roadway Rolling
	Revised Effective 7-1-69
20-01	Approaches
39-01	8" P.C. Concrete Pavement Sawed Joints with Tie Bars
39-02	8" P.C. Concrete Pavement Expansion Joints with Dowel Sleeves
39-03	8" P.C. Concrete Pavement Sawed Joints
39-04	8" P.C. Concrete Pavement Construction Joint and Header
	Revised Effective 7-1-69
39-09	8" P.C. Concrete Pavement Keyway Joints
39-10	P.C. Concrete Pavement Tapered Panel Connection
39-12	P.C. Concrete Pavement Bridge Approach Panel
	Deleted as of 4-1-70
39-13	P.C. Concrete Pavement Skewed Bridge Approach Panel
	Deleted as of 4-1-70
39-14	Standard Concrete Approach Slabs to Structures
	Added Effective 1-1-70
	Deleted as of 4-1-70



39-14(A)	Standard Concrete Approach Slab to Structures Added Effective 4-1-70
39-14(B)	Standard Concrete Approach Slab to Structures Added Effective 4-1-70
39-15	Standard Concrete Approach Slabs to Structures with U-Type Abutments Added Effective 1-1-70 Deleted as of 4-1-70
39-15(A)	Standard Concrete Approach Slabs to Structures with U-Type Abutments Added Effective 4-1-70
39-15(B)	Standard Concrete Approach Slabs to Structures with U-Type Abutments Added Effective 4-1-70
41-01	Box Culvert Data - Reference
41-05	Box Culvert Data - Reference
50-01	Culvert Riprap
50-01	Culvert Riprap Revised Effective 1-1-70
50-02	Grouted Riprap
50-03	Riprap Quantities
50-04	Embankment Protection
50-05	Concrete Drainage Chute Added Effective 7-1-69 Revised Effective 4-1-70
50-20	Concrete Slope Protection Deleted as of 1-1-71
50-20(A)	Concrete Slope Protection Added Effective 1-1-71
50-20(B)	Concrete Slope Protection Added Effective 1-1-71
50-20(C)	Concrete Slope Protection Added Effective 1-1-71
50-21	Concrete Slope Protection - Alternate II Deleted as of 1-1-71
50-21(A)	Concrete Slope Protection - Alternate II Added Effective 1-1-71
50-21(B)	Concrete Slope Protection - Alternate II Added Effective 1-1-71
51-01	Metal Bin - Type Retaining Wall
51-02	Concrete Crib Retaining Wall
51-03	Backfill Retainer and Cutoff Wall for Vehicular Underpass Revised Effective 4-1-70
54-01	Culvert Bedding Deleted as of 1-1-71
54-01	RCP Culvert Bedding Added Effective 1-1-71
54-02	Typical Field Cast Concrete Bend RCP to CMP Connection Detail
54-03	Bedding Material Revised Effective 1-1-70 Revised Effective 4-1-70
54-04	Filter Material for Underdrains
54-05	Syphon Pipe



- 54-06 CSP & SSPP Culvert Bedding  
Added Effective 1-1-71
- 56-01 Gage Table for Corrugated Steel Pipe 2 2/3 x 1/2 Corrugation H-20 Loading  
Deleted as of 1-1-70
- 56-01 Thickness for Corrugated Steel Pipe 2 2/3 x 1/2 Corrugation H-20 Loading  
Added Effective 1-1-70  
Deleted as of 1-1-71
- 56-01 Fill Height for CSP, H-20 Loading, 2 2/3 x 1/2 Corrugations  
Added Effective 1-1-71
- 56-02 Gage Table for Corrugated Steel Pipe 3 x 1 Corrugation H-20 Loading  
Deleted as of 1-1-70
- 56-02 Thickness for Corrugated Steel Pipe 3 x 1 Corrugation H-20 Loading  
Added Effective 1-1-70  
Deleted as of 1-1-71
- 56-02 Fill Height for CSP, H-20 Loading, 3 x 1 Corrugations  
Added Effective 1-1-71
- 56-03 Gage Table for Corrugated Steel Pipe 3 x 1 Corrugation H-20 Loading  
Deleted as of 1-1-70
- 56-03 Thickness for Corrugated Steel Pipe 3 x 1 Corrugation H-20 Loading  
Added Effective 1-1-70
- 56-04 Gage Table for Corrugated and Structural Plate Pipes for Railroad Cooper E-72 Live Load  
Deleted as of 1-1-70
- 56-04 Thickness for Corrugated and Structural Plate Pipes for Railroad Cooper E-72 Live Load  
Added Effective 1-1-70
- 56-05 Corrugated Metal Syphon Pipe
- 56-06 Supports for Corrugated Metal Pipes
- 56-07 Flared End Terminal Section Round Corrugated Metal Pipe  
Revised Effective 7-1-69  
Revised Effective 1-1-70
- 56-10 Embankment Protector  
Revised Effective 7-1-69  
Revised Effective 1-1-70  
Revised Effective 1-1-71
- 57-00 Fill Height for CSP Arch, 3 x 1 Corrugations  
Added Effective 1-1-71
- 57-01 Gage Table for Corrugated Steel Pipe Arch H-20 Loading  
Deleted as of 1-1-70
- 57-01 Thickness for Corrugated Steel Pipe Arch H-20 Loading  
Added Effective 1-1-70  
Deleted as of 1-1-71
- 57-01 Fill Height for CSP Arch, 2 2/3 x 1/2 Corrugations  
Added Effective 1-1-71
- 57-02 Flared End Terminal Section Corrugated Metal Pipe Arch Culvert  
Revised Effective 7-1-69  
Revised Effective 1-1-70
- 57-03 Bevel on Corrugated Steel Pipe Arch  
Revised Effective 7-1-69  
Revised Effective 1-1-70



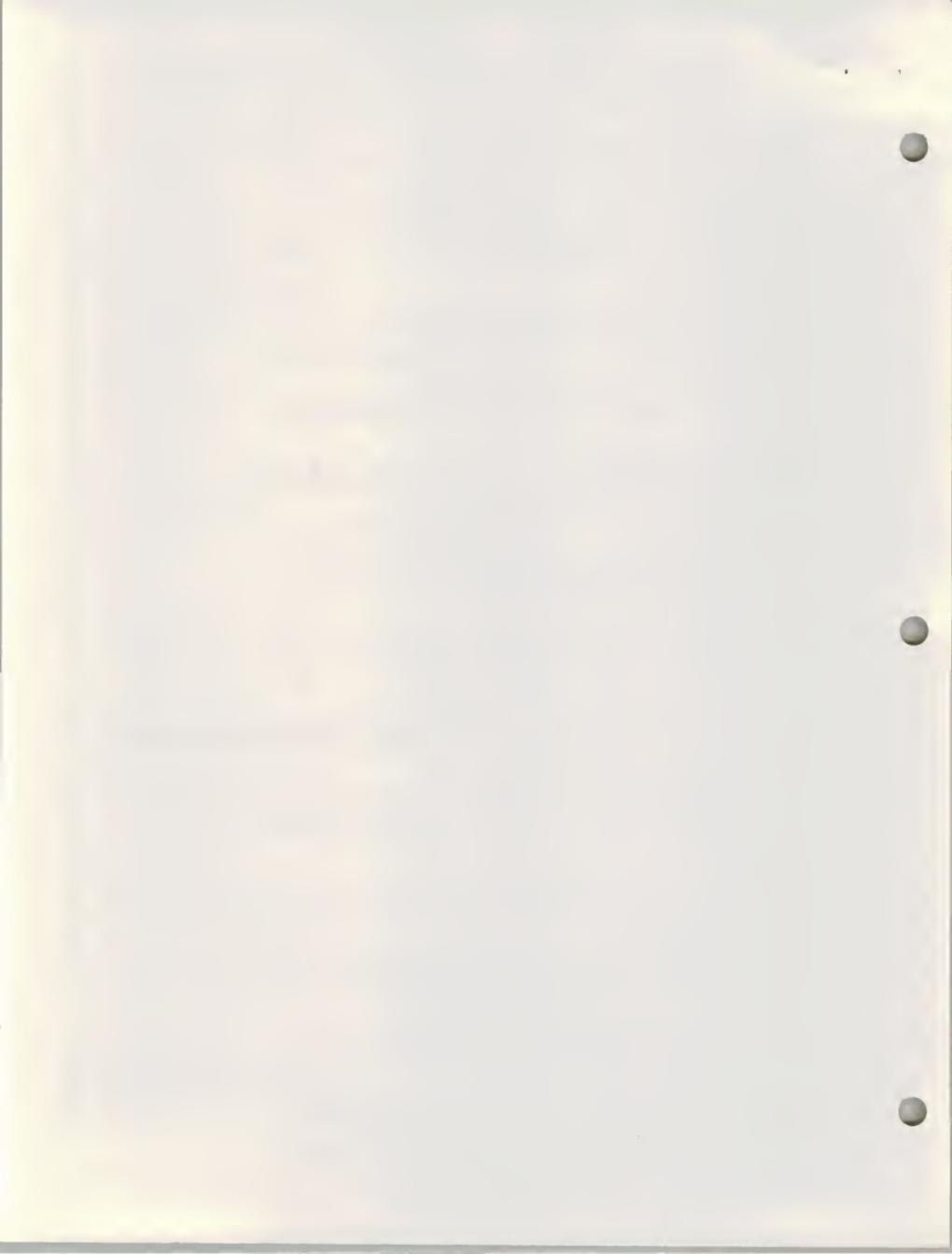
59-00 Fill Height For C. S. P. H-20 Loading, 6 x 2 Corrugations  
Added Effective 1-1-71  
59-01 Gage Table for Steel Structural Plate Pipe and Pipe-Arch  
H-20 Live Load  
Deleted as of 1-1-71  
59-01 Fill Height For C. S. P. Arch, 6 x 2 Corrugations  
Added Effective 1-1-71  
59-02 Structural Plate Pipe Stockpass  
59-03 Step Bevel for Circular CSP and SSP  
Revised Effective 1-1-70  
59-04 Stock and Vehicular Underpass and Drainage Structures  
Structural Plate Pipe Arch  
Deleted as of 4-1-70  
59-04 Vehicular Underpass  
Added Effective 4-1-70  
59-05 Bevel on Structural Plate Pipe - Arch  
59-06 Circular Vehicle Underpass Structural Plate Pipe  
  
62-01 Loading For Round R. C. P. Culverts  
62-02 Prefabricated Terminal Section for Reinforced Concrete Pipe  
62-03 Prefabricated Terminal Section for Reinforced Concrete Pipe  
62-04 Precast Split Section Reinforced Concrete Pipe  
  
63-01 Prefabricated Concrete Underpass  
63-02 Prefabricated R. C. F. Arch Culvert and Terminal Section  
  
65-01 Gage Table for Corrugated Aluminum Pipe H-20 Live Load  
Deleted as of 1-1-70  
65-01 Thickness for Corrugated Aluminum Pipe H-20 Live Load  
Added Effective 1-1-70  
  
69-01 Semicircular Underdrain  
Revised Effective 7-1-69  
Revised Effective 1-1-70  
  
73-01 Wooden Division Box  
73-02 Concrete Division Box  
73-03 Pipe Drop  
73-04 Inlet and Outlet Headwalls for R. C. P. and C. M. P. Pipes  
73-05 Cutoff Walls for Culverts  
73-06 Cutoff Wall Quantities  
73-07 Standard Ditch Drop  
73-08 Concrete Edge Protection for Structural Plate Pipe Culverts  
and for Structural Plate Pipe Arch Culvert  
73-09 Concrete Edge Protection for Concrete Pipe Culverts  
Added Effective 4-1-70  
73-10 Concrete Edge Protection for Concrete Arch Culverts  
Added Effective 4-1-70  
  
75-01 Standard Curbs  
75-02 Concrete Median Curbs  
75-03 Precast Traffic Curb



76-01	Concrete Sidewalk
77-01	Combination Manhole and Catch Basin
77-02	Drop Inlet Boxes and Covers
77-03	Median Inlet Cover
77-04	Median Inlet Cover Type "A" for Metal Riser
77-05	Precast Concrete Manhole
77-06	Curb Inlet Box and Cover
	Revised Effective 4-1-70
77-07	Median Inlet - 10.0 Ft. Median
80-01	Chain Link Fence
80-02	Median Barrier Fence
	Revised Effective 1-1-70
81-01	Wire Fence - Interstate Type
	Revised Effective 1-1-71
81-02	Wire Fence - Interstate Type
	Revised Effective 1-1-71
81-03	Farm Fence
	Added Effective 1-1-71
82-01	Cattle Guard
	Revised Effective 1-1-70
83-01	Wood Slat Snow Fence
83-02	Farm Fence
	Deleted as of 1-1-71
85-01	Type I Pull Box Details
85-02	Type II Pull Box Details
87-01	Traffic Signal and Highway Lighting Symbols
87-02	Electrical Service Details
87-03	Controller Cabinet Details and Pedestals
87-04	Signal Head Details
87-05	Vehicular Signal Mountings
87-06	Pedestrain Signal Mountings
87-07	Type I Standard and Typical Equipment Mountings
87-09	Pedestrian Push Button Details
87-10	Type X Standard and Typical Equipment Mountings
87-10 A	Standard Aluminum Type 10-A
87-12	Type II Standard and Typical Equipment Mountings
87-18	Typical Wiring Diagram of Service Equipment
87-21	Loop Detector Installation Detail
87-22	Watertight Connectors
87-42	Lighting Brackets and Installation Details
87-43	Guy and Anchor Assemblies
87-44	Tie Wire Detail
87-45	Insulator Assembly Details
87-52	Installation Details Overhead Conductor - Steel Poles
88-02	Regulatory Sign Panel Specifications
88-03	Warning Sign Panel Specifications
88-04	Route Marker Panel Specifications
88-06	R2-11, R4-10, R4-11 and R4-7
88-07	Standard R2-2A, R2-3A and R2-12 Signs
	Deleted as of 1-1-71



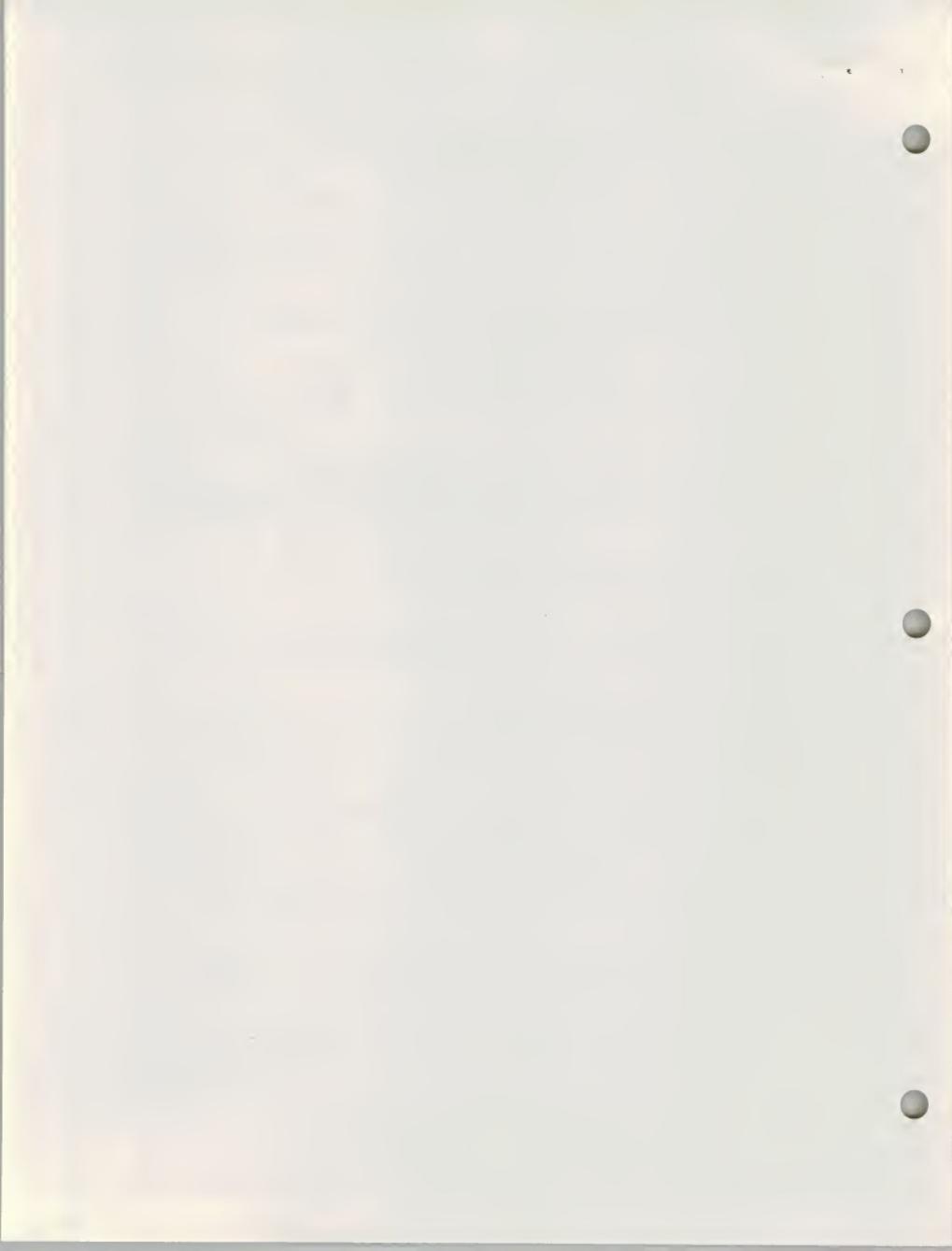
- 88-07 Standard R2-12 Sign  
Added Effective 1-1-71
- 88-08 R4-12, R4-13, R10-8 and R10-9
- 88-09 Signing of Median U-Turns  
Revised Effective 1-1-70  
Revised Effective 1-1-71
- 88-10 Standard R2-8 Signs
- 88-11 R4-14 and R4-15
- 88-12 R4-9
- 88-16 Standard W4-2 Warning Sign  
Revised Effective 1-1-71
- 88-17 W6-4, W6-5, W12-3 and X3-2 Warning Signs
- 88-18 W6-4A and W6-4B  
Revised Effective 1-1-71
- 88-19 W8-9, W9-2, W9-5 and W9-6 Warning Signs  
Revised Effective 1-1-71
- 88-26 Interstate Business Shields
- 88-27 Primary Route Marker for Use on Guide Signs
- 88-28 Secondary Route Marker for Use on Guide Signs  
Revised Effective 1-1-71
- 88-29 Standard M1-6 and M1-7 Route Markers
- 88-36 Typical Guide Sign Layout  
Revised Effective 1-1-71
- 88-37 Informational Signs  
Deleted as of 1-1-71
- 88-37 A Informational Signs - Services  
Added Effective 1-1-71
- Informational Signs - Rest Area  
Added Effective 1-1-71
- 88-38 Standard N6-2 Stream Name Sign  
Deleted as of 1-1-71
- 88-38 Standard N6-2 Stream Name Sign Primary and Secondary Routes  
Added Effective 1-1-71
- 88-39 Weigh Station Signs  
Revised Effective 7-1-69  
Revised Effective 1-1-71
- 88-47 Standard Rest Area and Information Signs  
Revised Effective 1-1-71
- 88-48 Informational Signs
- 88-56 Typical Approach Road Signing  
Revised Effective 1-1-70
- 88-57 Typical Sign Erection  
Revised Effective 1-1-71
- 88-58 Typical Crossroad and Ramp Layout  
Revised Effective 1-1-70  
Revised Effective 1-1-71
- 88-59 Typical Guide Sign Placement  
Revised Effective 1-1-70
- 88-66 Standard Guide Signs  
Revised Effective 1-1-71
- 88-67 Guide Sign Placement
- 88-68 Aluminum Sheet Increment Guide Signs  
Revised Effective 1-1-71
- 88-69 Plywood Sheet Increment Guide Signs
- 88-70 Guide Sign Mounting Details  
Revised Effective 1-1-71



88-71 Railroad Crossing Signs  
88-72 Railroad Crossing Signs  
Revised Effective 1-1-71  
88-73 Interstate and Primary Mileposts  
88-74 XI-1 Sign and Erection Detail  
Revised Effective 1-1-70  
Revised Effective 1-1-71  
88-75 Typical Pipe Post Mounting Detail  
Revised Effective 1-1-71  
88-76 Wood Pole Slot Detail  
Revised Effective 1-1-71  
88-77 Typical Sign Erection  
Revised Effective 1-1-71  
88-78 Typical Route Marker Assembly with Treated Timber Post  
Revised Effective 1-1-71  
88-79 Typical Route Marker Assembly with Treated Timber Pole  
88-80 Typical Route Marker Assemblies with Steel Posts  
88-81 Typical Sign Erection - Steel Posts  
88-91 Delineators  
Deleted as of 7-1-69  
88-91 Delineators Type I  
Added Effective 7-1-69  
88-91 A Delineators Type II  
Added Effective 7-1-69  
88-92 Delineator Spacing for Horizontal Highway Curves  
Revised Effective 1-1-70  
Revised Effective 1-1-71  
90-00 5" Guide Posts  
Added Effective 1-1-71  
90-01 Wood Guide Posts  
90-02 Metal Guard Rail  
Revised Effective 7-1-69  
Revised Effective 1-1-71  
90-02 A Metal Median Rail  
Deleted as of 1-1-71  
90-03 Standard Guard Rail Anchor Section  
Deleted as of 1-1-71  
90-03 Metal Median Rail  
Added Effective 1-1-71  
90-04 2-Lane, 2-Way Bridge End Treatment  
Deleted as of 1-1-71  
90-04 Bridge End Treatment  
Added Effective 1-1-71  
90-05 Multi-lane Bridge End and Bridge Pier Treatment  
Revised Effective 7-1-69  
Deleted as of 1-1-71  
90-05 Guard Rail Terminal Sections - Sheet 1  
Added Effective 1-1-71  
90-06 Guard Rail Terminal Sections - Sheet 2  
Added Effective 1-1-71  
\* 90-06 Cable Guard Rail  
Change this Drawing No. to 90-20



- + 90-07      Cable Guard Rail Driveway Anchor Section  
                Change this Drawing No. to 90-21
- 90-07      Pier Treatment  
                Added Effective 1-1-71
- 90-08      Guard Rail for Grade Crossing Protection  
                Deleted as of 1-1-71
- 90-14      Guard Rail for Grade Crossing Protection  
                Added Effective 1-1-71
- 90-15      Combination Guard Rail and Header  
                Revised Effective 7-1-69
- 90-16      Layout of Combination Guard Rail and Header
- 90-17      Reflector-Washer  
                Added Effective 1-1-70
- 90-18      Flex Beam Guard Rail Bridge Approach  
                Added Effective 1-1-70  
                Revised Effective 4-1-70
- \* 90-20     Cable Guard Rail  
                Drawing No. 90-06 Effective 1-1-69 Remains Unchanged  
                Except Drawing No. Changed to 90-20
- + 90-21     Cable Guard Rail Driveway Anchor Section  
                Drawing No. 90-07 Effective 1-1-69 Remains Unchanged  
                Except Drawing No. Changed to 90-21
  
- 96-01      Monuments and Markers  
96-01      Revised Effective 1-1-70
  
- 100-01     Outdoor Fireplace
- 100-02     Grate Details for Concrete Fireplace
- 100-03     Bench
- 100-04     Park Bench
- 100-05     Timber Picnic Table
- 100-06     Stone Picnic Table
- 100-07     Stone Picnic Table
- 100-08     Two Table Picnic Shelter
- 100-09     Well Shelter
- 100-10     Exhibit Case
- 100-11     Planting and Staking Procedures
- 100-12     Garbage Can Rack
- 100-13     Historical Marker  
                Added Effective 7-1-69  
                Revised Effective 1-1-71



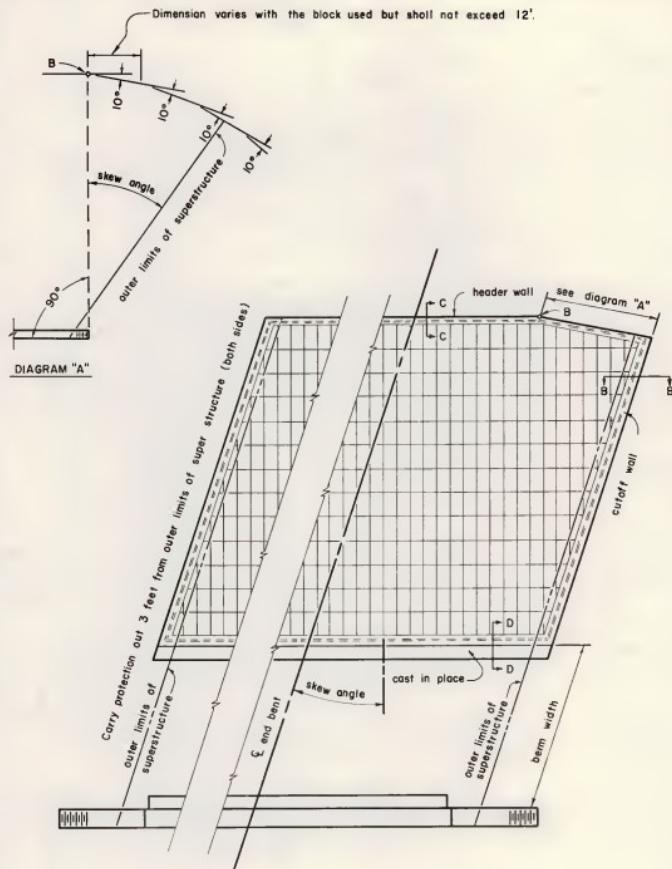
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STATE HIGHWAY COMMISSION  
HELENA, MONTANA

STANDARD DRAWING NO. 50-20-A

CONCRETE SLOPE PROTECTION  
(SEE 50-20 B & C)

APPROVED  
*Stanley M. Chaffee*  
STATE HIGHWAY ENGINEER



SKEWED BRIDGE

NOTE:

Odd sections may be precast or cast in place at the contractors option.

Drawings not to scale.



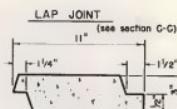
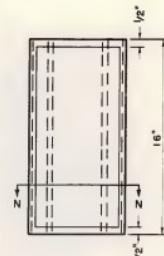
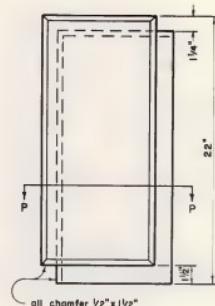
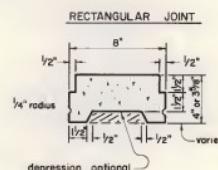
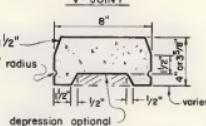
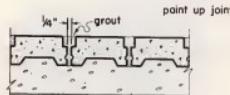
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HELENA, MONTANA

STANDARD DRAWING NO. 50-20-B

CONCRETE SLOPE PROTECTION  
(SEE 50-20 A & C)

APPROVED

STATE HIGHWAY ENGINEER

SECTION P-PRECTANGULAR JOINTV-JOINTSECTION N-N

Typical placement of the rectangular &amp; V-joint

## NOTES

Size of Precast Blocks The contractor may choose the type and size of blocks. The blocks may be 11" x 22", 22" x 44", or 44" x 66". Rectangular or V-joint blocks may be 8" x 16", 16" x 32", 32" x 48".

Placement of Slope Protection The concrete slope protection shall be placed after the structure has been finished and backfill around the structure is in place.

Embankment Preparation: The embankment slope shall be cleared of all brush, debris, and rubble. When a cushion is used the embankment slope shall be leveled to a reasonably uniform slope. Where no cushion is used, level to the slope indicated on the bridge plans. All loose material shall be compacted to the satisfaction of the engineer. A minimum of four inch sand-gravel cushion and leveling course shall be placed on the prepared embankment slope. Adjacent slope area shall be left in a smooth, uniform condition.

Interrupted Block Pattern: The area around bents or where the regular block pattern is interrupted shall be constructed with cast-in-place concrete and shall be worked into sections with an approved groover to match the pattern of the surrounding blocks. An approved one-half inch expansion joint filler material shall be used where the blocks or cast-in-place concrete abut against any part of the structure.



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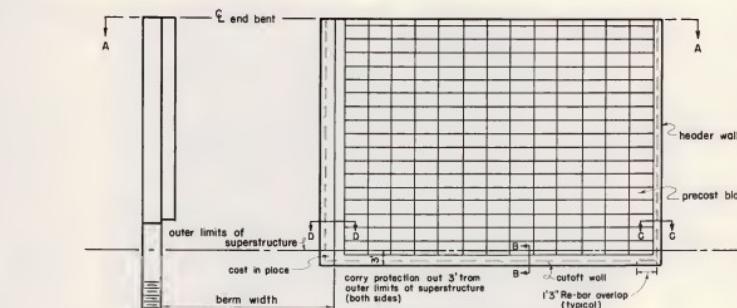
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

**CONCRETE SLOPE PROTECTION  
(SEE 50-20 A&B)**

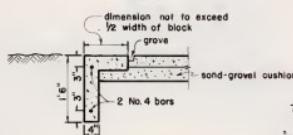
**STANDARD DRAWING NO. 50-20-C**

APPROVE

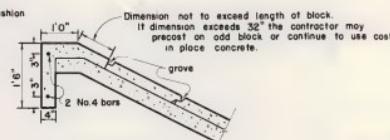
Lance Deller  
STATE HIGHWAY ENGINEER



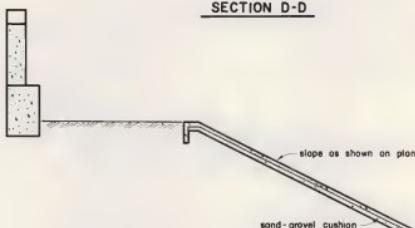
**Straight Bridge**



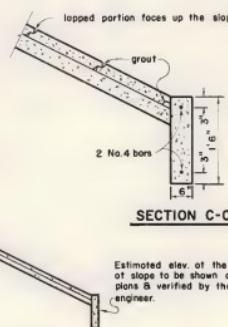
**SECTION B-B**



SECTION D-D



**SECTION C-C**



**SECTION A-A**

## NOTES

**NOTES**  
**Precast Blocks.** Rectangular blocks shall be placed with the longest dimension running up the slope blocks of any site shall be the same size and type.

All blocks shall be sound and free from cracks or other defects that would interfere with the proper placing of unit, or impair the strength or permanence of the construction. Any blocks broken or damaged so that the function of the block is impaired before the final inspection of finished project shall be replaced by the contractor at his expense.

General. Concrete headers and cutoff walls shall be included in the slope paving area and paid for in square yards of slope paving. Concrete used shall be class "DD" (the concrete slope protection will cover the area shown on the plans) concrete-class "DD" or equal.



REVISED  
EFFECTIVE

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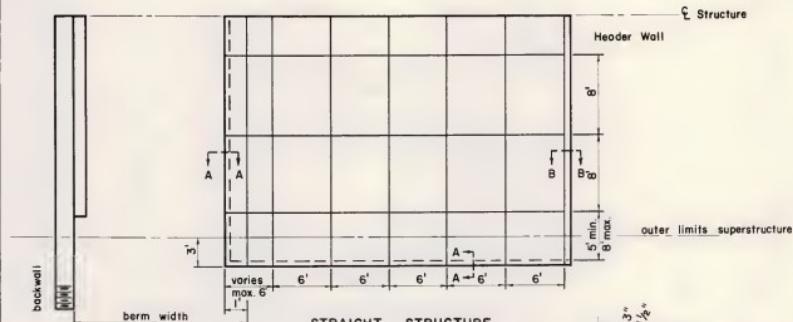
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

**CONCRETE SLOPE PROTECTION  
ALTERNATE II (SEE 50-21 B)**

**STANDARD DRAWING NO. 50-21-A**

APPROVED

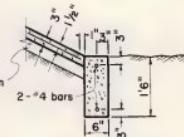
~~STATE HIGHWAY ENGINEER~~



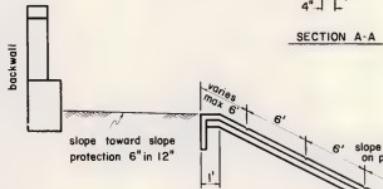
## **Straight Structure**



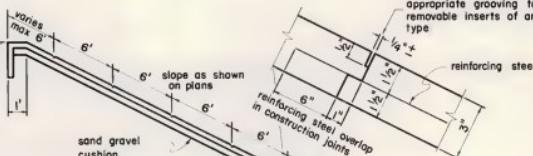
### outer limits superstructure



SECTION B-B



dimension varies but shall not exceed 12 feet.



points may be sawed, made with the appropriate grooving tools, or removable inserts of an approved type.



#### **VERTICAL & HORIZONTAL CONSTRUCTION JOINT**

Use as need in placing slab. When required will be used in lieu of a dimension joint at the same spacing as a dimension joint.



## **VERTICAL & HORIZONTAL DIMENSION JOINT**

**DIMENSION JOINT**  
To be placed at 6' vertical spacing or as noted  
To be placed at 8' horizontal spacing or as noted.  
Joints may be sawed, made with grooving tools, or  
removable inserts of an approved type.

DIAGRAM "A"



REVISED  
EFFECTIVE

1-1-71

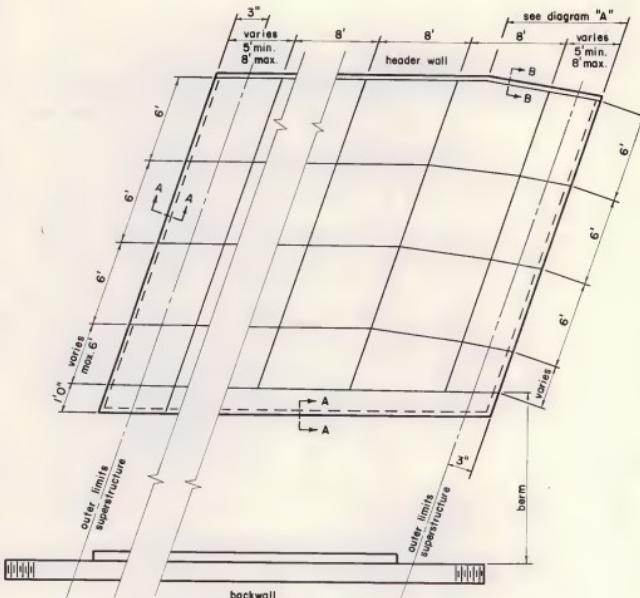
STANDARD DRAWING NO. 50-21-B

STATE HIGHWAY COMMISSION  
HELENA, MONTANACONCRETE SLOPE PROTECTION  
ALTERNATE II (SEE 50-21A)

APPROVED

*James C. Miller*

STATE HIGHWAY ENGINEER

SKEWED STRUCTURE

## NOTE:

For additional notes see Standard Drawing No. 50-02

CAST IN PLACE CONCRETE

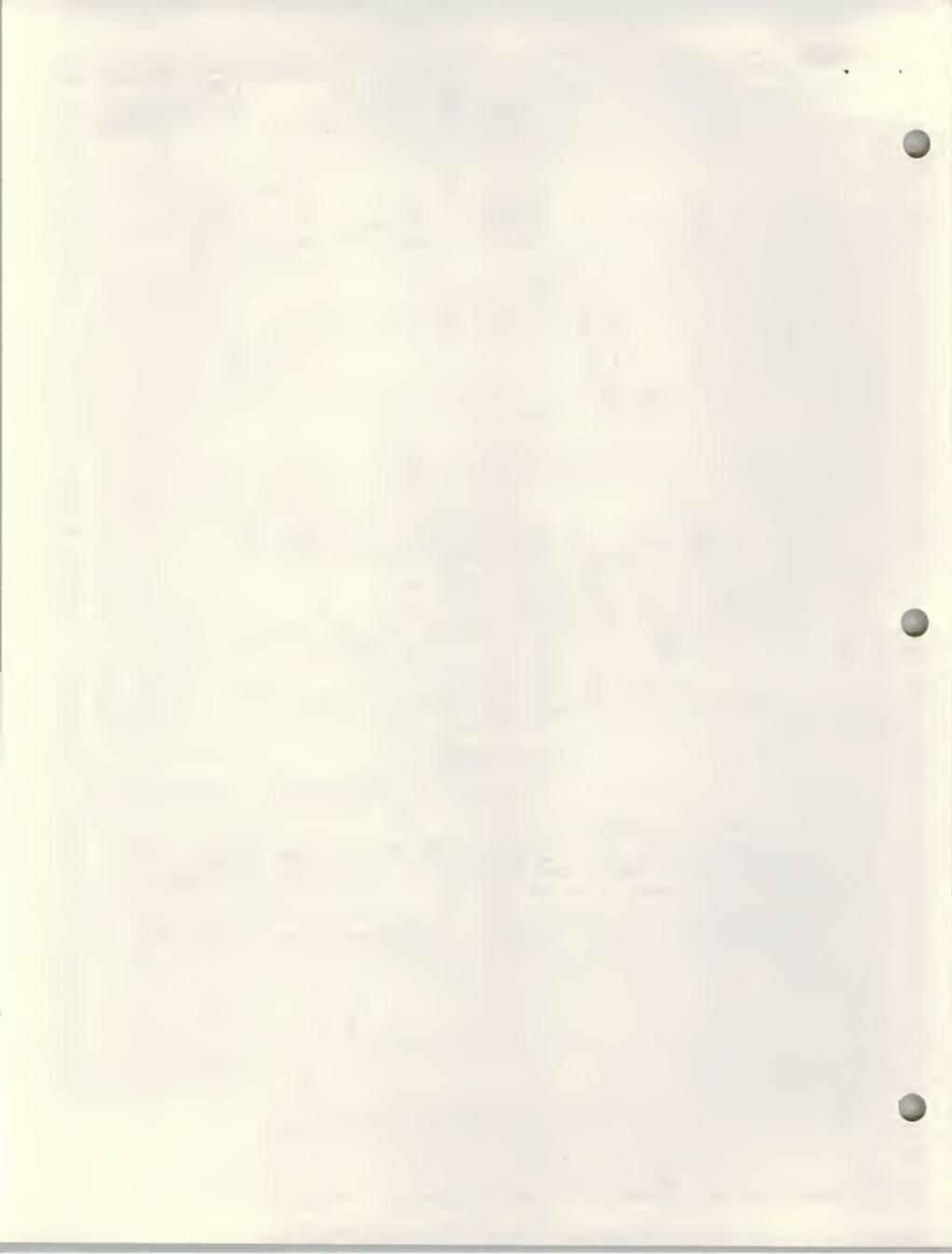
Locate joints as indicated on the plans. If construction is stopped for over two hours a construction joint shall be made. Payment shall be the same as for concrete blocks. Class "DD" concrete shall be used for all cast-in-place concrete.

An approved one half inch expansion joint filler shall be used wherever the cast in place concrete abuts against any part of the bridge structure concrete - class "DD" or equal.

REINFORCING STEEL

- (may use either alternate listed below)
1. 3 bars at 0'10" centers (horiz. & vert spacing)  
min. cover of 1 inch.
  2. Welded wire fabric 6"x6"x 4 gage.

Six inch lap required at construction joints for reinforcing steel.



REVISED 7-9-68 10-25-68 11-16-70  
EFFECTIVE 11-1-68 1-1-69 1-1-71

STANDARD DRAWING NO. 54-01

State Highway Commission  
Helena, Montana

Approved  
S. J. [Signature] 9-22-68  
State Highway Engineer

DESCRIPTION OF BEDDING CLASSES

**CLASS A CONCRETE CROWN BEDDING.** THE LOWER PART OF THE PIPE EXTERIOR SHALL BE BURIED IN A CONTINUOUS THICKNESS UNDER THE PIPE OF ONE-FOURTH THE NOMINAL INSIDE DIAMETER AND EXTENDING UP THE SIDES OF THE PIPE FOR A HEIGHT EQUAL TO ONE-FOURTH OF THE OUTSIDE DIAMETER. THE CRADLE SHALL HAVE A WIDTH AT LEAST EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE PLUS 6" AND IT SHALL BE CONSTRUCTED MONOLITHICALLY WITHOUT HORIZONTAL CONSTRUCTION JOINTS.

**CLASS B BEDDING.** (1) THIS CLASS OF BEDDING FOR ENHANCEMENT CONDITION IS APPLICABLE ONLY WHEN THE PROJECTION RATIO IS NOT GREATER THAN 0.7. THE PIPE SHALL BE CAREFULLY REBEDDED ON FINE GRANULAR MATERIALS OVER AN EARTH FOUNDATION, ACCURATELY SHAPED BY MEANS OF A TEMPLATE TO FIT THE LOWER PART OF THE PIPE EXTERIOR FOR AT LEAST 10% OF THE CULVERT OVERALL HEIGHT. COMPACTABLE SOIL MATERIAL SHALL THEN BE RAMMED AND TAMPED IN LAYERS NO MORE THAN 6" THICK, AROUND THE PIPE FOR THE REMAINDER OF THE LOWER 20% OF ITS HEIGHT. BACKFILL VISIONS OF THE STANDARD SPECIFICATIONS.

(2) FOR TRENCH CONDITIONS, THIS CULVERT IS PLACED AS DESCRIBED IN B(1) EXCEPT THAT THE EARTH FOUNDATION NEEDS TO BE SHARED TO FIT THE LOWER PART OF THE CULVERT EXTERIOR FOR A WIDTH OF AT LAST 60% OF THE SIDEWALLS. THE CULVERT IS ENTIRELY SUPPORTED BY THE SIDEWALLS, WHICH ARE AS PRACTICABLE AS THE CULVERT. THE FILL IS TAMPED THIN LAYERS, NOT RAMMED, AND UNDER THE MATERIAL BLOCK BY HAND TO THE FINISH LINE.

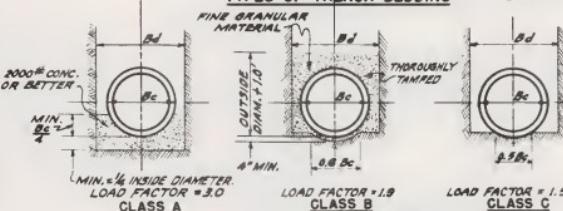
**CLASS B-1 BEDDING.** IN THIS TYPE OF INSTALLATION, SOMETIME'S CALLED THE IMPERFECT TRENCH METHOD, THE PIPE CULVERT SHALL BE FIRST INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF B(2). THE LENGTH OF THE PIPE SHALL BE COMPACTED AT EACH SIDE OF THE OUTSIDE DIAMETER OR 12", LATERAL DISTANCE EQUAL TO TWICE THE OUTSIDE DIAMETER. IT SHALL BE AS VERTICAL AS POSSIBLE. AFTER THE TRENCH IS EXCAVATED, IT SHALL BE REPAVED WITH LOOSE, HIGHLY COMPRESSIBLE SOIL MATERIAL, STRAW, HAY, LEAVES, BRUSH OR SANDSTOES MAY BE USED TO FILL THE LOWER ONE-FOURTH TO ONE-THIRD OF THE TRENCH IN ORDER TO INSURE HIGH COMPRESSIBILITY OF THIS BACKFILL. THE BACKFILL OF STRAW, HAY, ETC. SHALL NOT BE CARRIED CLOSER THAN 10' TO THE OUTLINE SLOPE OF THE TRENCH; THE OUTLINE 10' ABOVE THE TOP OF THE PIPE. CARE SHALL BE EXERCISED TO KEEP THE SIDES REPAVED WITH THE CULVERT IN PLACE. THE BALANCE OF THE FILL SHALL BE CONSTRUCTED BY NORMAL METHODS UP TO THE FINISHED GRADE OF PENDAMENT.

**CLASS C BEDDING.** FOR PROJECTING ENHANCEMENT CULVERT, THIS METHOD OF BEDDING IS RECOMMENDED. THE CULVERT EXTERIOR IS PLACED ON AN EARTH FOUNDATION SHAPED TO THE OUTLINE OF THE CULVERT EXTERIOR IN A REASONABLY CLOSENESS, LEAVING AT LEAST ONE-FOURTH THE SIDEWALLS OF THE CULVERT IN THE CASE OF EARTH FOUNDATION, AT LEAST SIX INCHES OF THE CULVERT LENGTH. IN THE CASE OF ROCK FOUNDATION, THE REAR EDGE OF PIPE SHALL BE SURROUNDED BY MATERIAL PLACED BY HAND TO FILL COMPLETELY ALL SPACES UNDER AND ADJACENT TO THE PIPE. BACKFILLING TO THE TOP SHALL THEN BE COMPLETED AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

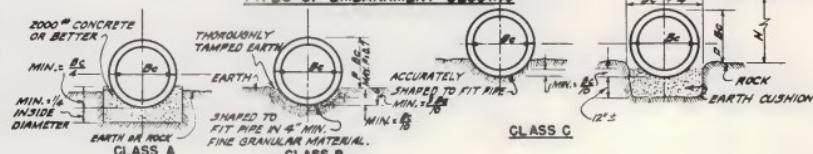
IF THE CULVERT IS PLACED ON ROCK FOUNDATIONS, PROJECTING ENHANCEMENT CULVERTS ARE REBEDDED ON AN EARTH CUSHION HAVING A MINIMUM ALLOWABLE THICKNESS OF 2' AND FILLED AROUND THE CULVERT THE SAME AS ORDINARY PROJECTING ENHANCEMENT BEDDING ON AN EARTH FOUNDATION.

**CLASS C-1 BEDDING.** THE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH CLASS C BEDDING. THE IMPERFECT TRENCH METHOD SHALL THEN BE USED AS DESCRIBED UNDER CLASS B-1 BEDDING.

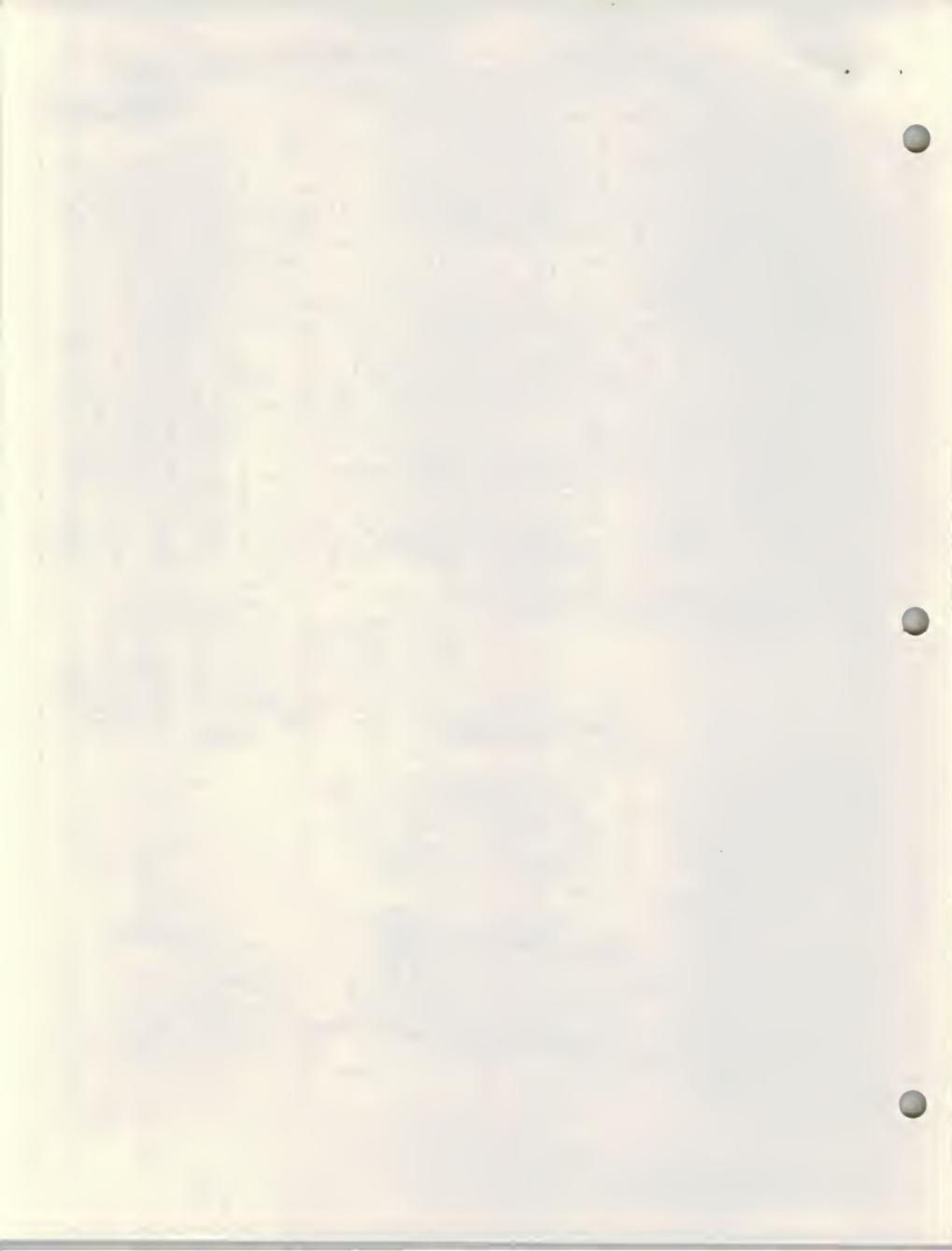
### TYPES OF TRENCH BEDDING



### TYPES OF EMBANKMENT BEDDING



WHEN NATURAL GROUND MATERIAL SIMULATES BEDDING MATERIAL, NO SPECIAL BEDDING MATERIAL NEED BE USED. USE CLASS "C" UNLESS OTHERWISE NOTED ON PLANS.



REVISED  
EFFECTIVE 1-1-71

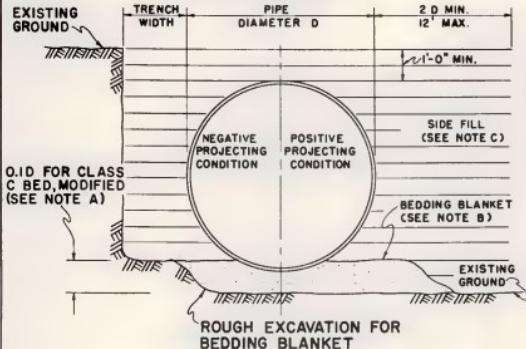
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

STANDARD DRAWING NO. 54-06

C.S.P. & S.S.P.P. CULVERT BEDDING

APPROVED  
*Frank G. Miller*  
STATE HIGHWAY ENGINEER

I-PIPE INSTALLATION AND BEDDING  
(CLASS C, MODIFIED)



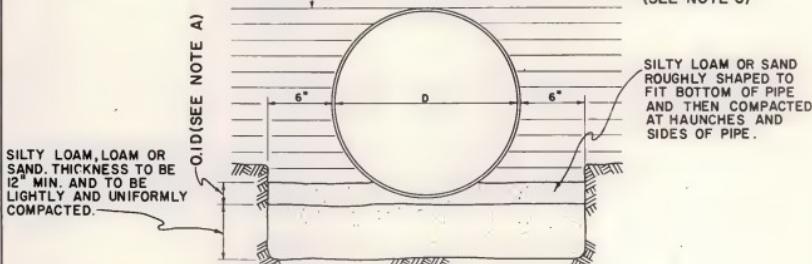
NOTES

(A) FOR STRUCTURAL PLATE PIPE, THE LENGTH OF BEDDING ARC NEED NOT EXCEED WIDTH OF BOTTOM PLATE.

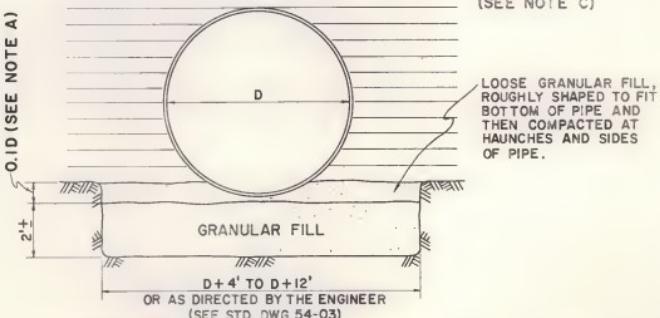
(B) BEDDING BLANKET OF SILTY LOAM OR SAND ROUGHLY SHAPED TO FIT BOTTOM OF PIPE. MINIMUM THICKNESS BEFORE PLACING PIPE IS 3".

(C) SIDE FILL TO BE COMPACTED IN 6" LAYERS TO DENSITY SPECIFIED FOR ADJACENT EMBANKMENT. SEE ARTICLE H.05 OF STANDARD SPECS. FOR THE DENSITY REQUIREMENTS.

2-ROCK



3-FOUNDATION STABILIZATION





REVISED  
EFFECTIVE 1-1-71  
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

STANDARD DRAWING NO. 56-01

FILL HEIGHT FOR C.S.P. H-20  
LOADING 2 $\frac{2}{3}$ "X $\frac{1}{2}$ " CORRUGATIONS

APPROVED *John W. Miller*  
STATE HIGHWAY ENGINEER

FOR CORRUGATED STEEL PIPE, 2 $\frac{2}{3}$ -INCH BY  $\frac{1}{2}$ -INCH CORRUGATIONS, RIVETED  
WELDED, OR HELICAL FABRICATION, H-20 LOADING.

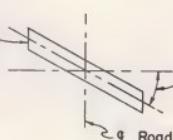
PIPE DIAMETER IN INCHES	MINIMUM COVER, TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	AREA IN SQUARE FEET	MAXIMUM FILL HEIGHTS ABOVE TOP OF PIPE IN FEET				
			METAL THICKNESS IN INCHES				
			0.064	0.079	0.109	0.138	0.168
12	12	0.8	84	91			
15	12	1.2	67	73			
18	12	1.8	56	61			
24	12	3.1	42	46	59		
30	12	4.9	34	36	47		
36	12	7.1	28	30	39	41	
42	12	9.6	31	43	46(67)	48(70)	50(73)
48	12	12.6	27	37	45(58)	46(61)	47(64)
54	12	15.9		33	43(52)	44(54)	45(57)
60	12	19.6			43(47)	43(49)	44(51)
66	12	23.8			42	43	43(47)
72	12	28.3				41	43
78	12	33.2					39
84	12	38.5					35

NOTES: VALUES FOR ELONGATED PIPE ARE SHOWN IN PARENTHESIS. USE SPECIAL DESIGN  
FOR STRUCTURES WITH HEIGHTS OF COVER EXCEEDING THESE TABLES.

SEE STD. DWG. 56-02 FOR GALVANIZED STEEL THICKNESS AND GAGE TABLE.

IF SKEW IS REQUIRED SEE STD. DWG. NO. 56-01.

Cut end of culvert  
parallel to E. of  
road when specified.



Angle of skew degrees  
to left and right.

NOTE: When skew angle exceeds 20° and the  
pipe arch has the ends cut to fit a  
slope, ends shall be reinforced with  
masonry.



REVISED  
EFFECTIVE 1-1-71

STANDARD DRAWING NO. 56-U2

STATE HIGHWAY COMMISSION  
HELENA, MONTANAFILL HEIGHT FOR C.S.P., H-20  
LOADING, 3"X1" CORRUGATIONSAPPROVED  
*J. C. Chiles*  
STATE HIGHWAY ENGINEERFOR CORRUGATED STEEL PIPE, 3-INCH BY 1-INCH CORRUGATIONS, RIVETED,  
WELDED, HELICAL, OR BOLTED FABRICATION, H-20 LOADING.

PIPE DIAMETER IN INCHES	MINIMUM COVER, TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	AREA IN SQUARE FEET	MAXIMUM FILL HEIGHTS ABOVE TOP OF PIPE IN FEET				
			METAL THICKNESS IN INCHES				
			0.064	0.079	0.109	0.138	0.168
36	12	7	48	60	78(88)	89(106)	101(118)
42	12	10	41	51	64(76)	71(91)	79(101)
48	12	13	36	45	57(66)	61(80)	66(88)
54	12	16	32	40	52(59)	55(71)	59(79)
60	12	20	29	36	49(53)	51(64)	54(71)
66	12	24	26	33	47	49(58)	51(64)
72	12	28	24	30	44	47(53)	49(59)
78	12	33	22	28	41	46(49)	47(54)
84	12	38	21	26	38	45	46(51)
90	12	44	19	24	35	43	45
96	12	50	18	22	33	40	44
102	24	57	17	21	31	38	42
108	24	64		20	30	35	39
114	24	71		19	28	34	37
120	24	78			27	32	35

NOTES: VALUES FOR ELONGATED PIPE ARE SHOWN IN PARENTHESIS. USE SPECIAL DESIGN  
FOR STRUCTURES WITH HEIGHTS OF COVER EXCEEDING THESE TABLES.

IF SKEW IS REQUIRED SEE STD. DWG. NO. 56-01.

## GALVANIZED STEEL THICKNESS AND GAGES

ZINC COATED STEEL THICKNESS IN INCHES	GAGE NO. FOR INFORMATIONAL PURPOSES ONLY
0.064	16
0.079	14
0.109	12
0.188	10
0.168	8
0.168	7
0.218	5
0.249	3
0.280	1



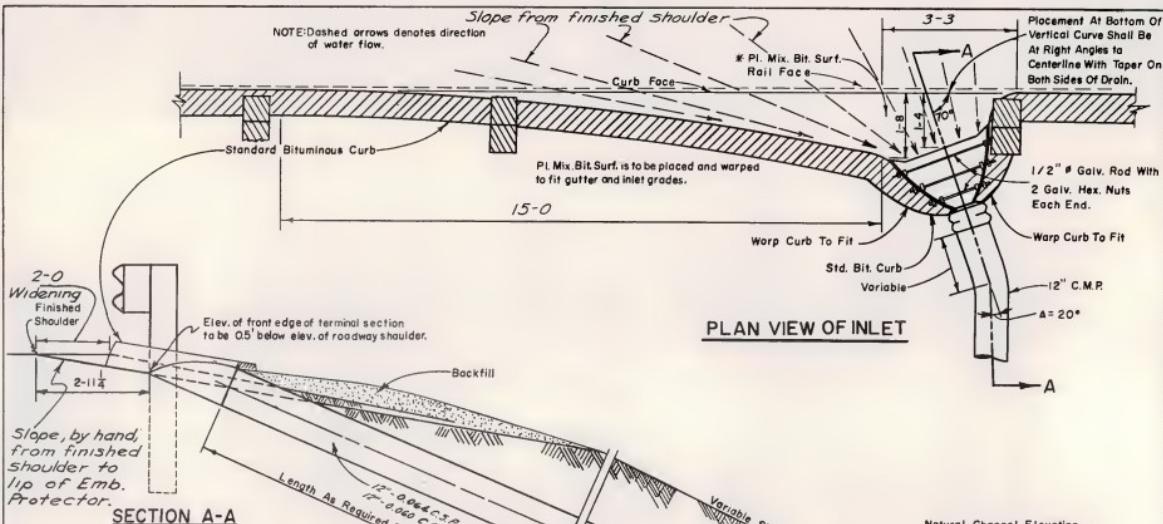
SECTION	9-1-68	11-68	5-20-69	12-8-69	1-1-70	1-1-71
State Highway Commission Helena, Montana	1-1-68	-	7-7-69	1-1-70	1-1-71	

## EMBANKMENT PROTECTOR

Standard Drawing No. 56-10

Approved  
Lester M. Schmitz  
State Highway Engineer

### PLAN VIEW OF INLET



### SECTION A-A

#### GENERAL NOTES

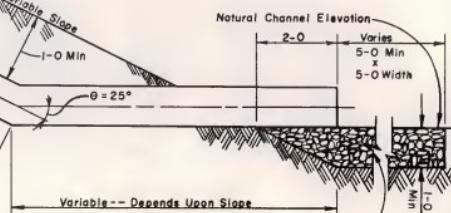
Conduit May Be Either Circumferential Or Helical.  
⑧ And A Shall Be As Shown Unless Otherwise Specified In The Plans Or By The Engineer.

Contractor Shall Not Order Pipe Until Directed By The Engineer.  
Flared End Section May Be Called For On Outlet End When Specified On Plans.

Embankment Protector Shall Be Bid As Unit Price Bid Per Lin. Ft.  
The 12" Flared End Section, 12" C.M.P. And Bends, Are To Be Included In Total Length Of Embankment Protector.

All Other Hardware Shall Be Included In The Unit Price Bid Per Lin. Ft. Of Embankment Protector.

\* Included With Roadway Quantities.



Approx.  $\frac{1}{2}$  Cu. Yd. Type 3 Bank Protection--To Be Placed In Manner Best Suited To Fit Existing Conditions.

### OUTLET DETAIL



REVISED  
EFFECTIVE 1-1-71

STANDARD DRAWING NO. 57-00

STATE HIGHWAY COMMISSION  
HELENA, MONTANAFILL HEIGHT FOR C.S.P. ARCH  
3"X1" CORRUGATIONSAPPROVED  
*James M. Bell*  
STATE HIGHWAY ENGINEER

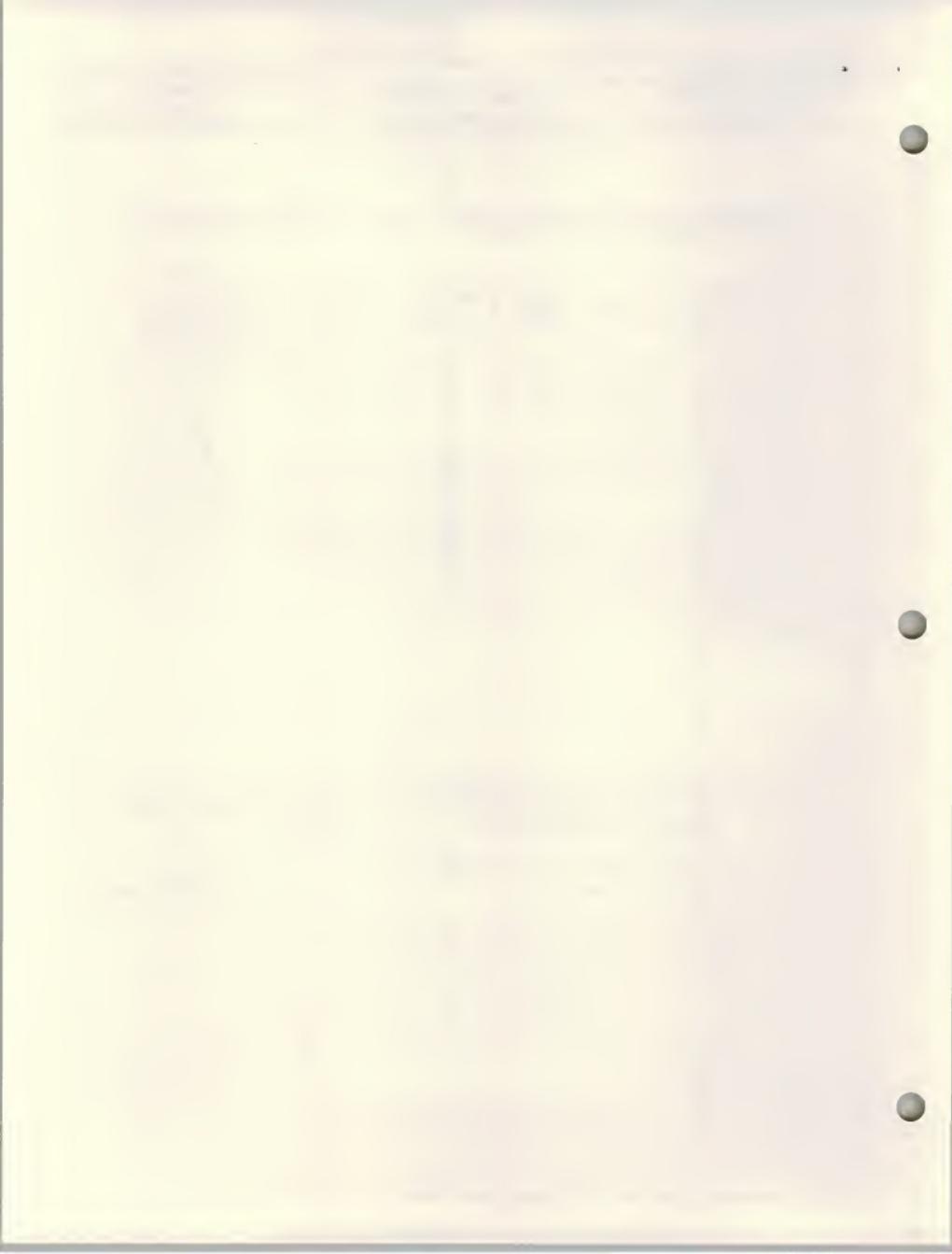
CORRUGATED STEEL PIPE ARCHES, 3-INCH BY 1-INCH CORRUGATIONS, RIVETED, WELDED, OR HELICAL FABRICATION, H-20 LOADING.

PIPE DIMENSIONS SPAN X RISE (INCHES)	AREA (SQ. FT.)	CORNER RADIUS INCHES	MINIMUM COVER INCHES	MINIMUM THICKNESS REQUIRED ( INCHES)	MAXIMUM FILL HEIGHTS (FEET)
					CORNER BEARING PRESSURE 2-TONS / SQ.FT.
43 X 27	6.4	7 3/4	18	0.064	12
50 X 31	8.7	9	18	0.064	12
58 X 36	11.4	10 1/2	18	0.064	12
65 X 40	14.3	12	18	0.064	12
72 X 44	17.6	13 1/4	18	0.064	12
73 X 55	21.3	18	18	0.064	15+
81 X 59	25.3	18	18	0.079	15
87 X 63	31.0	18	18	0.079	14
95 X 67	35.0	18	18	0.109	13
103 X 71	40.0	18	24	0.109	12
112 X 75	46.0	18	24	0.109	11
117 X 79	52.0	18	24	0.109	10
128 X 83	58.0	18	24	0.138	9

NOTES: WHERE BEARING PRESSURES EXCEEDING 2 TONS PER SQUARE FOOT ARE REQUIRED FOR GIVEN FILL HEIGHT, THE FOUNDATION MATERIAL SHALL BE INVESTIGATED TO DETERMINE ITS BEARING CAPACITY.

IF SKEW IS REQUIRED SEE STD. DWG. NO. 56-01.

SEE STD. DWG. NO. 56-02 FOR GALVANIZED STEEL THICKNESS AND GAGE TABLE.



REVISED  
EFFECTIVE 1-1-71STATE HIGHWAY COMMISSION  
HELENA, MONTANA

STANDARD DRAWING NO. 57-01

## FILL HEIGHT FOR C.S.P. ARCH

2 2/3"X1/2" CORRUGATIONS

APPROVED

STATE HIGHWAY ENGINEER

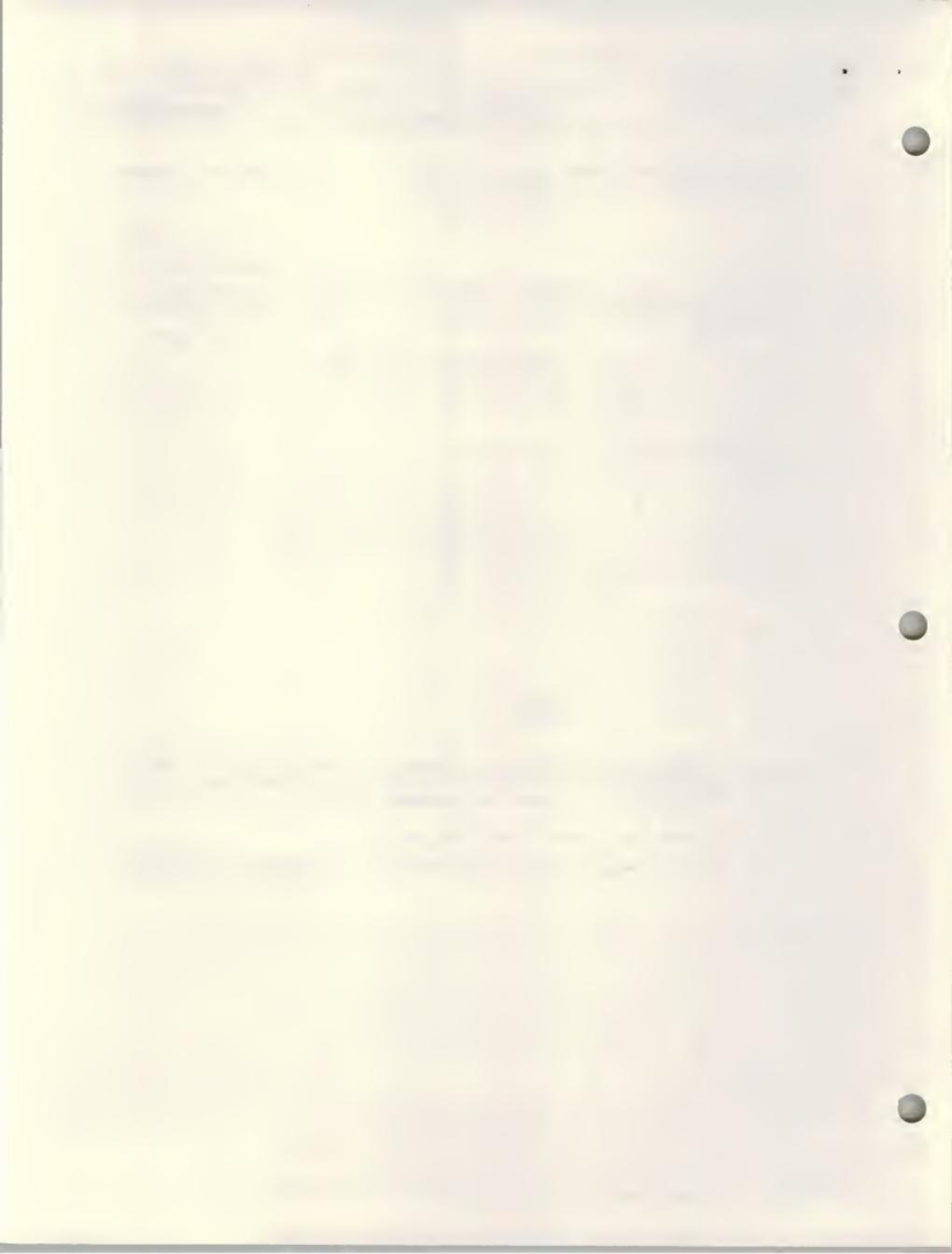
FOR CORRUGATED STEEL PIPE ARCHES, 2 2/3-INCH BY 1/2 INCH CORRUGATIONS, RIVETED,  
WELDED, OR HELICAL FABRICATION, H-20 LOADING.

PIPE DIMENSIONS SPAN X RISE (INCHES)	AREA (SQ.FT.)	CORNER RADIUS (INCHES)	MINIMUM COVER (INCHES)	MINIMUM THICKNESS REQUIRED (INCHES)	MAXIMUM FILL HEIGHTS (FEET)
					CORNER BEARING PRESSURE 2 TONS / SQ.FT.
IBX11	1.1	3 1/2	18	0.064	13
22X13	1.6	4	18	0.064	12
25X16	2.2	4	18	0.064	10
29X18	2.8	4 1/2	18	0.064	10
36X22	4.4	5	18	0.064	9
43X27	6.4	5 1/2	18	0.064	9
50X31	8.7	6	18	0.079	8
58X36	11.4	7	18	0.109	8
65X40	14.3	8	18	0.109	8
72X44	17.6	9	18	0.138	8
79X49	21.3	10	18	0.168	8
85X54	25.3	11	18	0.168	9

NOTES: WHERE BEARING PRESSURES EXCEEDING 2 TONS PER SQUARE FOOT ARE REQUIRED FOR GIVEN FULL HEIGHT, THE FOUNDATION MATERIAL SHALL BE INVESTIGATED TO DETERMINE ITS BEARING CAPACITY.

IF SKEW IS REQUIRED SEE STD. DWG. NO. 56-01.

SEE STD. DWG. NO. 56-02 FOR GALVANIZED STEEL THICKNESS AND GAGE TABLE.



REVISED  
EFFECTIVE 1-1-71

STANDARD DRAWING NO. 59-00

STATE HIGHWAY COMMISSION

HELENA, MONTANA

FILL HEIGHT FOR C.S.P. H-20  
LOADING 6"X2" CORRUGATIONS

APPROVED

John McCallum  
STATE HIGHWAY ENGINEERFOR CORRUGATED STEEL PIPE, 6-INCH BY 2-INCH CORRUGATIONS, BOLTED FABRICATION,  
H-20 LOADING.

PIPE DIAMETER IN INCHES	MINIMUM COVER TOP OF PIPE TO TOP OF SUBGRADE (INCHES)	MAXIMUM FILL HEIGHTS ABOVE TOP OF PIPE IN FEET						
		METAL THICKNESS IN INCHES						
		0.109	0.138	0.168	0.188	0.218	0.249	0.280
120	12	43	62	81	93	106(111)	116(132)	126(144)
72	12	36	52	68	73(78)	79(93)	85(110)	91(120)
84	12	31	44	58	61(67)	65(79)	69(94)	72(103)
96	12	27	39	51	55(58)	57(69)	60(82)	62(90)
108	24	24	34	45	50	52(62)	54(73)	56(80)
120	24	22	31	41	47	49(56)	50(66)	52(72)
132	24	20	28	37	42	47(51)	48(60)	49(66)
144	24	18	26	34	39	45	46(55)	47(60)
156	24	17	24	31	36	43	45(50)	46(56)
168	24	15	22	29	33	40	44(47)	45(52)
180	24	14	21	27	31	37	44	44(48)
192	24		19	25	29	35	41	43
204	36		18	24	27	33	39	43
216	36			23	26	31	37	40
228	36			21	25	29	35	38
240	36				23	28	33	36
252	36					27	31	34

NOTES: VALUES FOR ELONGATED PIPE ARE SHOWN IN PARENTHESIS.

USE SPECIAL DESIGN FOR STRUCTURES WITH HEIGHTS OF COVER EXCEEDING THESE TABLES.

IF SKEW IS REQUIRED SEE STD. DWG. NO. 56-01.

SEE STD. DWG. 56-02 FOR GALVANIZED STEEL THICKNESS AND GAGE TABLE.

PIPE DIAMETER (INCHES)	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	252
AREA (SQ. FT.)	19.6	28.3	38.5	50.3	63.6	78.5	95.0	113.1	132.7	153.9	176.7	201.1	227.0	254.5	283.5	314.2	346.4



REVISED  
EFFECTIVE 1-1-71

STANDARD DRAWING NO. 59-01

STATE HIGHWAY COMMISSION  
HELENA, MONTANAFILL HEIGHT FOR C.S.P. ARCH  
6"X2" CORRUGATIONSAPPROVED  
*[Signature]*  
STATE HIGHWAY ENGINEER

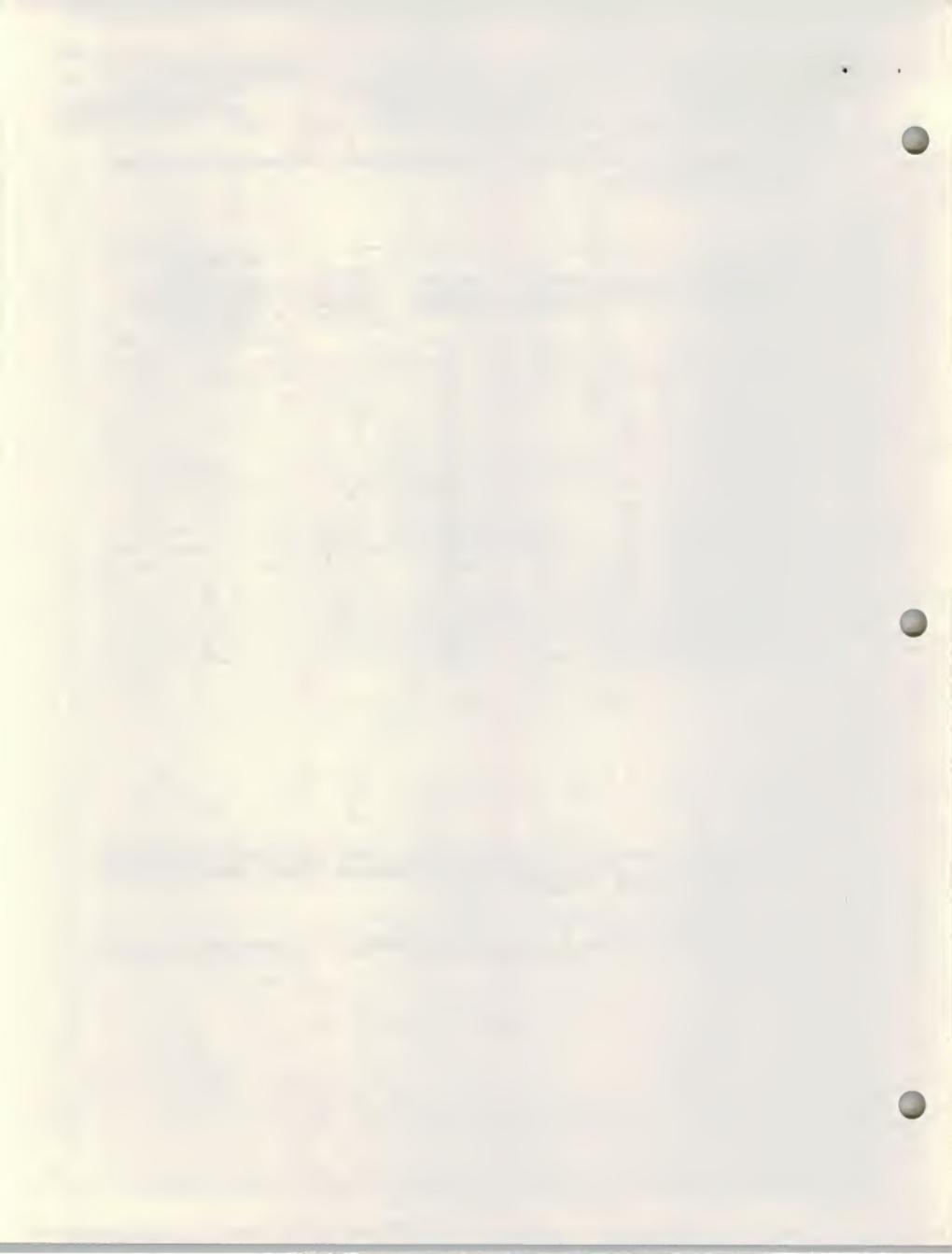
FOR CORRUGATED STEEL PIPE ARCHES, 6-INCH BY 2-INCH CORRUGATIONS, BOLTED, FABRICATION, H-20 LOADING.

PIPE DIMENSIONS SPAN X RISE (FT.-IN.)	AREA (SQ. FT.)	CORNER RADIUS (INCHES)	MINIMUM COVER (INCHES)	MINIMUM THICKNESS REQUIRED (INCHES)	MAXIMUM FILL HEIGHTS (FEET)
					CORNER BEARING PRESSURE 2 TONS / SQ.FT.
6'-1"X4'-7"	22	18	18	0.109	15
7'-0"X5'-1"	28	18	18	0.109	15
7'-1"X5'-7"	35	18	18	0.109	12
8'-10"X6'-1"	43	18	24	0.109	11
9'-9"X6'-7"	52	18	24	0.109	10
10'-1"X7'-1"	61	18	24	0.109	9
11'-10"X7'-7"	71	18	24	0.109	8
12'-10"X8'-4"	85	18	24	0.109	8
13'-3"X9'-4"	98	31	24	0.109	13
14'-2"X9'-10"	110	31	24	0.109	12
15'-4"X10'-4"	124	31	24	0.138	11
16'-3"X10'-10"	138	31	36	0.138	11
17'-2"X11'-4"	153	31	36	0.138	11
18'-1"X11'-10"	168	31	36	0.168	9
19'-3"X12'-4"	185	31	36	0.168	9
19'-11"X12'-10"	202	31	36	0.168	8
20'-7"X13'-2"	214	31	36	0.188	8

NOTES: WHERE BEARING PRESSURES EXCEEDING 2 TONS PER SQUARE FOOT ARE REQUIRED FOR GIVEN FILL HEIGHT, THE FOUNDATION MATERIAL SHALL BE INVESTED TO DETERMINE ITS BEARING CAPACITY.

IF SKEW IS REQUIRED SEE STD. DWG. NO. 56-01.

SEE STD. DWG. NO. 56-02 FOR GALVANIZED STEEL THICKNESS AND GAGE TABLE.



REVISED 9-1-66 11-22-68 9-1-70  
EFFECTIVE 9-1-66 11-1-69 1-1-71

STANDARD DRAWING NO. 81-01

State Highway Commission  
Helena, Montana

Approved  
*Frank D. Miller*  
State Highway Engineer

## WIRE FENCE - INTERSTATE TYPE

See Std. Dwg. No. 81-02

Nail roll to post with  
2 to 4 20d galv. nails

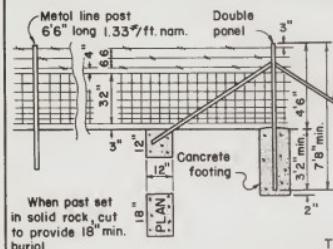
Brace roll to be notched as  
shown prior to treatment.

When square posts are  
used, notching is not  
necessary.

Do not dip  
post for  
brocail.  
Wires shall  
not be inter-  
woven at  
point of  
crossing.  
  
Posts:  
B'0" x 6" round  
or 5 1/2" sq. sawn.

SINGLE PANEL  
For pulling, stretching, changes in vertical  
alignment or panels on a run of less  
than 330'.

### TYPE "CW"- "STRAIGHT RUN" FENCE WITH WOOD POSTS



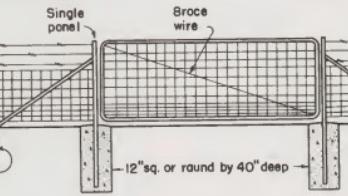
When post set  
in solid rock, cut  
to provide 18" min.  
burial.

LINE POST  
4" Min. round or  
4" x 4" std. sq.

DOUBLE PANEL  
Posts  
B'0" x 6" round or  
5 1/2" sq. sawn.

For corners, pulling or stretching, and changes  
in horizontal alignment.

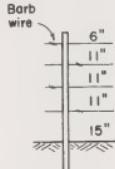
### TYPE "CM"- FENCE WITH STEEL POSTS



### STEEL GATE & BRACING



"M" indicates metal post.  
"W" indicates wood post.  
Braces, corners, deadmon  
and other features same  
as "CW" and "CM" fence.



### TYPE "CB4" & "CB5" WIRE FENCE

#### NOTES:

All fence wire to be placed on pasture side of post except curves, the wire shall be placed on the outside of the curve.

In areas subject to high velocity winds and moving debris, wires may all be placed on windward side of posts. Except on curves.

All concrete shall be class "F" or better.

Maximum bow in wood posts - 2" in 7'.

Post spacing measured generally parallel to ground.

Line post shall normally be spaced 16'6" apart. Also 16'6" from brocail or panel posts.

24" wire stoy to be placed halfway between posts, excepting panels on "CM" and "CW" fence.

Fence with wooden posts to have one metal post, in place of a wooden line post, in each 500' run for lighting protection.

Type "CW" panels (wood) will be used on type "CM" fence instead of steel panels when so specified.

Steel corner, end, gate and pull post and each brace shall be set in concrete as shown.

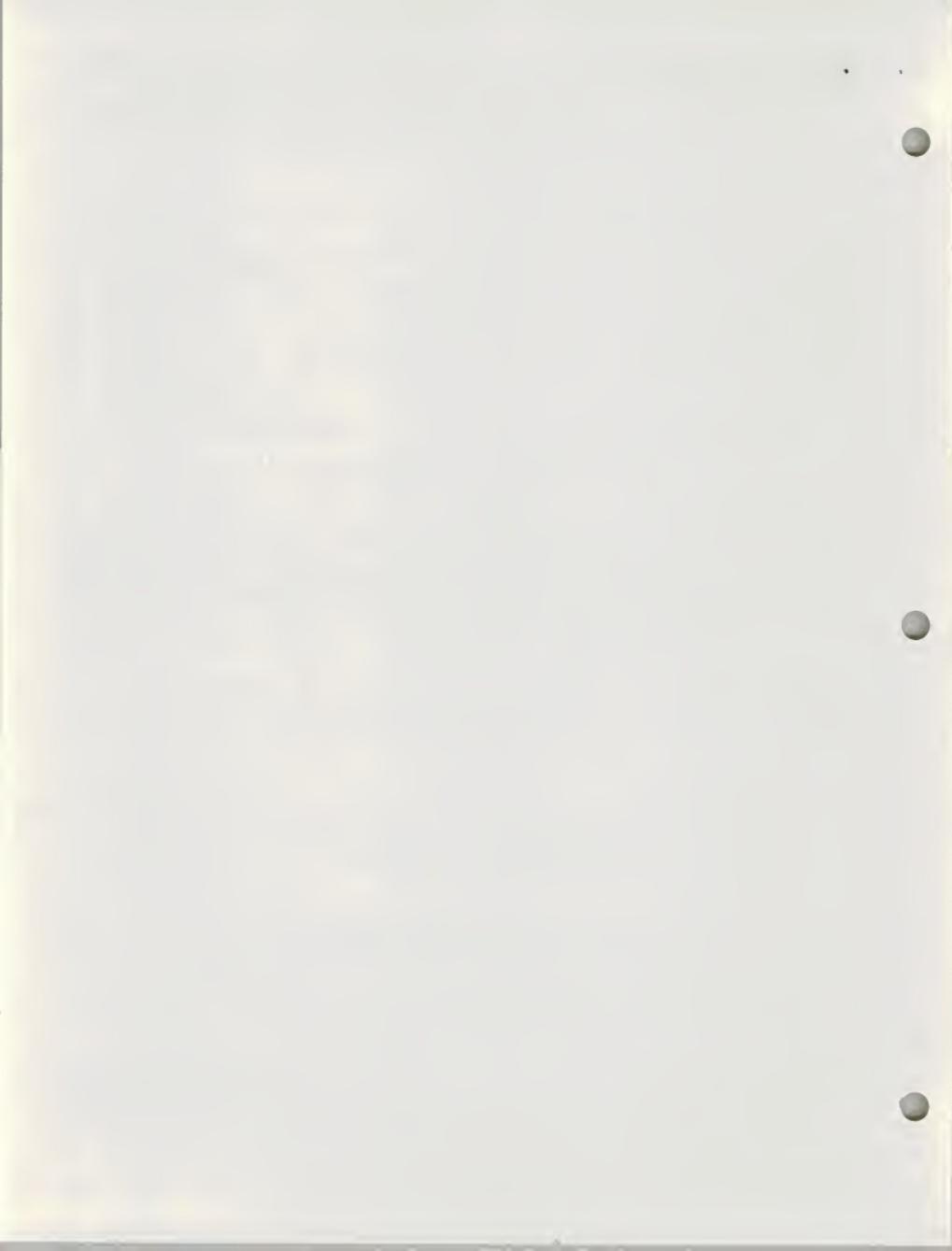
"Terminal Post" shall be at the end of any run of wire or of any stretch panel.

A deadmon may be a precast concrete block, a cast-in-place concrete block, a rock or other approved object-- weighing at least 150 lbs-- and covered at least 2 feet.

Staple the bottom, top, center and alternate wires of woven wire to wood line posts.

Staple all wires of woven wire to wood corner posts or past used to tie-off wire.

Maximum run between panels see STD. DWG. 81-02.



REVISED 9-1-66 11-22-68 9-1-70  
EFFECTIVE 9-1-66 11-1-69 1-1-71

STANDARD DRAWING NO. 81-02

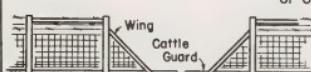
State Highway Commission  
Helena, Montana

## WIRE FENCE - INTERSTATE TYPE

Approved  
*[Signature]*  
State Highway Engineer

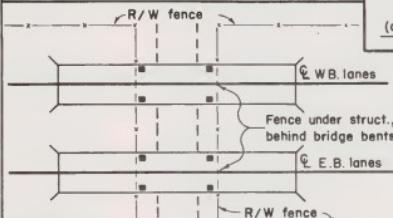


See Std.Dwg.No.  
81-01

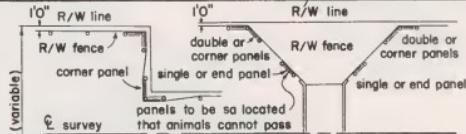


### FENCE CONNECTION TO CATTLE GUARD

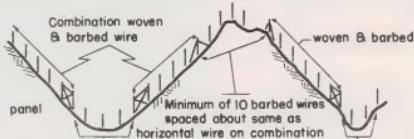
For detail of cattle guard see standard drawing  
Fence wire shall be securely fastened to the wings  
and so arranged that animals cannot pass.



PLAN OF FENCE  
(local road under Interstate)

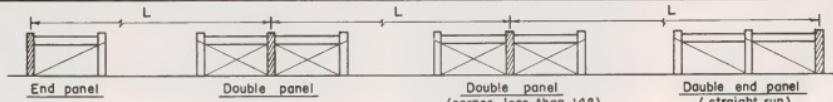


LAYOUT OF CROSS-FENCE CONNECTION

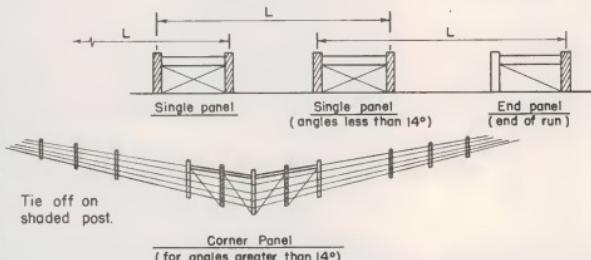


### FENCE CONSTRUCTION ON SHARP VERTICAL CURVES

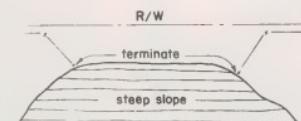
To avoid trying to conform woven wire to uneven terrain.



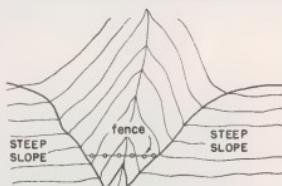
Fence type	run = L	panels required
Woven	33' or less	none
	33' - 330'	single or end
	over 330'	double
	max. 660'	<del>double</del>
Barbed	66' or less	none
	66' - 660'	single or end
	over 660'	double
	max. 990'	<del>double</del>



### PERMISSIBLE FENCE LAYOUTS WHERE STEEP BACKSLOPES OR BANKS EXIST



Slope must be steep enough to deter  
passage of undesirable trespassers.









Drawn 3-1-63

REVISED 9-16-64 9-1-70

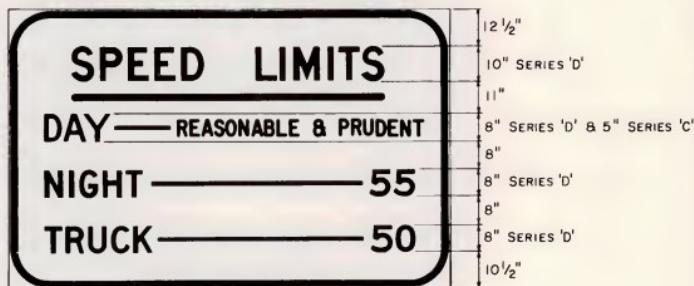
EFFECTIVE 9-16-64 1-1-71

STANDARD DRAWING NO. 88-07

State Highway Commission  
Helena, Montana

STANDARD R2-12 SIGN

Approved

Lester C. Johnson  
State Highway Engr.R2-12, BLACK LEGEND ON  
A WHITE REFLECTORIZED BACKGROUNDR2-12  
132" X 84"

## NOTE:

CENTER 1 1/2" BAR BETWEEN LINES 1 & 2  
DASHES IN LINES 2, 3, & 4 ARE 1" WIDE.  
THE MARGIN IS 1/2" AND THE BORDER IS 2".  
THE CORNER RADIUS IS 12".



Drawn 3-1-66

Revised 11-1-68 11-28-69 9-1-70

Effective 1-1-69 1-1-70 1-1-71

STANDARD DRAWING NO. 88-09

State Highway Commission  
Helena, Montana

## SIGNING OF MEDIAN U-TURNS

Approved  
James M. [Signature]  
State Highway EngineerR3-10  
36 x 48

R3 - 4

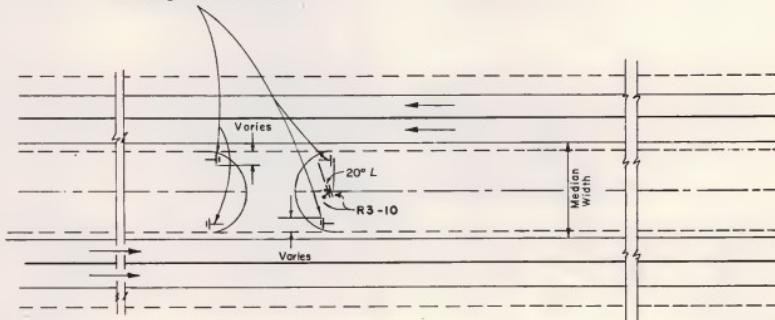


## Note:

R3-4 and R3-10 Shall have black legend on White reflectarized background.

For median widths of 76 feet or less, R3-10 Signs shall be mounted back to back. They shall be placed at the centerline of the median and on the side of the U-turn away from the nearest interchange. Median widths greater than 76 feet will require separate installations on either side of the U-turn at specified clearance. For openings through median guard rails, the sign post shall be placed in line with guard rail post.

Design 'B' delineator as  
specified in Standard  
Drawing No. 88-91



U-TURN MEDIAN OPENINGS  
(See Std. Dwg. 11-03)



Drawn 3-1-63

REVISED

EFFECTIVE 3-1-63

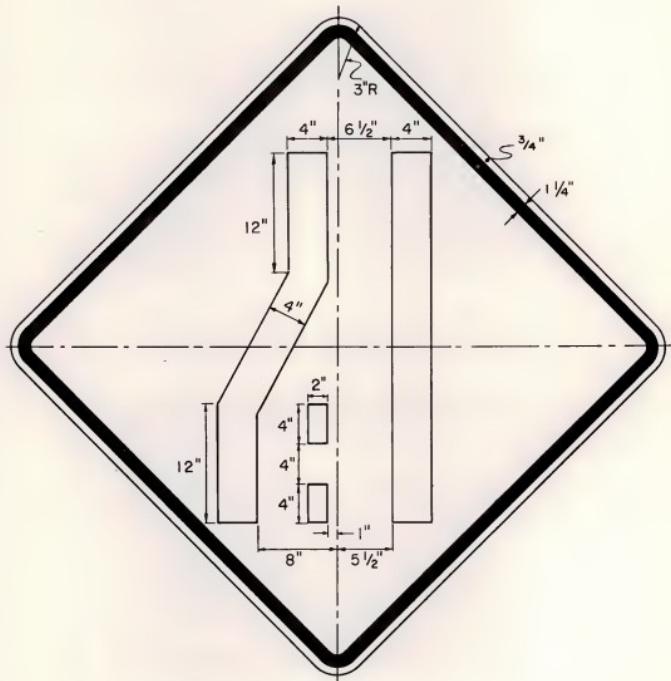
9-1-70

1-1-71

STANDARD DRAWING NO. 88-16

State Highway Commission  
Helena, Montana

## STANDARD W4-2 WARNING SIGN

Approved  
F. J. [Signature] 11-22-68  
State Highway EngineerW4-2  
48" X 48"

BLACK ON REFLECTORIZED YELLOW



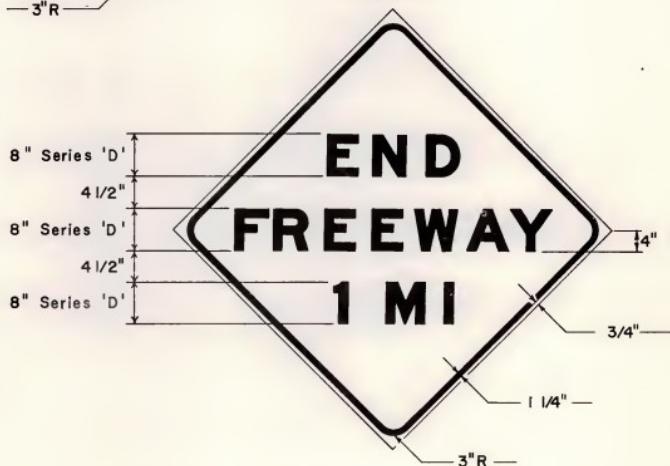
Drawn 6-19-68

Revised 9-1-70  
Effective 11-1-68 1-1-71

STANDARD DRAWING NO. 88-18

State Highway Commission  
Helena, MontanaApproved  
State Highway Engineer

## W6-4A &amp; W6-4B

W6-4A  
48" X 48"W6-4B  
48" X 48"

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Drawn 3-1-66

REVISED

3-1-66

9-1-70

1-1-71

STANDARD DRAWING NO.

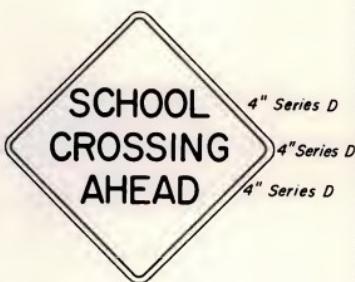
88 - 19

State Highway Commission  
Helena, Montana

W8-9, W9-2, W9-5, &amp; W9-6 WARNING SIGNS

Approved

Montana State Highway Engineer

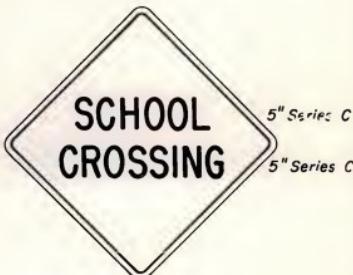
W8-9  
30 X 305" Series D  
5" Series DW9-5  
30 X 304" Series D  
4" Series D  
4" Series D

## NOTE

Warning sign W8-9 shall have black legend and borders on a reflectorized yellow background. The Bureau of Public Roads "STANDARD ALPHABET" shall be used.

## NOTE

Warning signs W9-2, W9-5, & W9-6 shall have black legend and borders on a yellow background. The Bureau of Public Roads "STANDARD ALPHABET" shall be used.

W9-6  
30 X 305" Series B  
5" Series B  
5" Series BW9-2  
30 X 305" Series C  
5" Series C

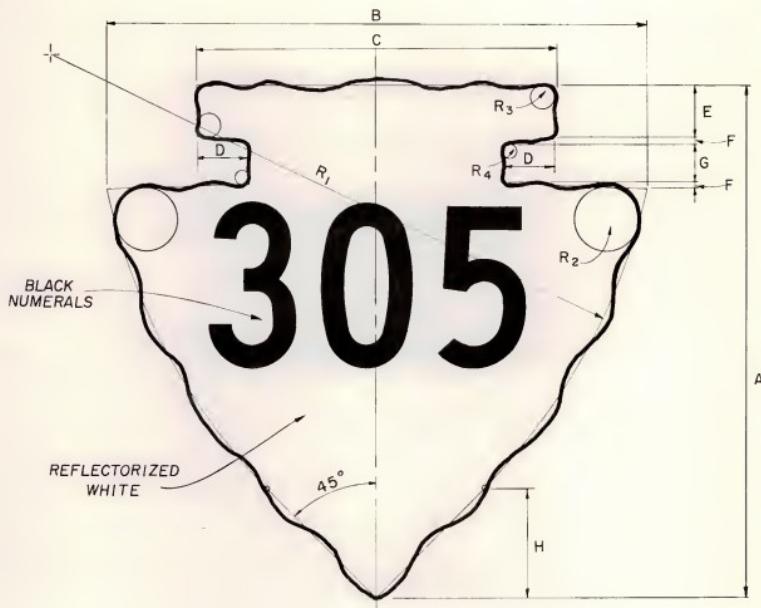
新華書局  
印製



Drawn 9-1-64

Revised 3-1-67 9-1-70  
Effective 6-1-67 1-1-71

STANDARD DRAWING NO. 88-28

State Highway Commission  
Helena, MontanaSECONDARY ROUTE MARKER  
FOR USE ON GUIDE SIGNSApproved  
Lewis M. Geltz  
Act. State Highway Engineer

SHIELD DIMENSIONS IN INCHES

NUMERAL SIZE	A	B	C	D	E	F	G	H	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>
* 8" C	26	28	18 $\frac{1}{2}$	2 $\frac{5}{8}$	3	$\frac{5}{16}$	2	5 $\frac{1}{2}$	32	1 $\frac{3}{4}$	$\frac{5}{8}$	$\frac{5}{16}$
** 10" C	32	34	22 $\frac{1}{2}$	3 $\frac{1}{4}$	3 $\frac{5}{8}$	$\frac{3}{8}$	2 $\frac{1}{2}$	6 $\frac{3}{4}$	38 $\frac{1}{2}$	2	$\frac{3}{4}$	$\frac{3}{8}$
*** 12" C	40	42	28	4	4 $\frac{1}{2}$	$\frac{1}{2}$	3	8 $\frac{7}{16}$	48	2 $\frac{1}{2}$	1	$\frac{1}{2}$

\* TO BE USED WITH STANDARD 24" U.S. SHIELD

\*\* TO BE USED WITH STANDARD 30" &amp; 36" U.S. SHIELD

\*\*\* TO BE USED WITH STANDARD 42" U.S. SHIELD &amp; ALL INDEPENDENT USE

303

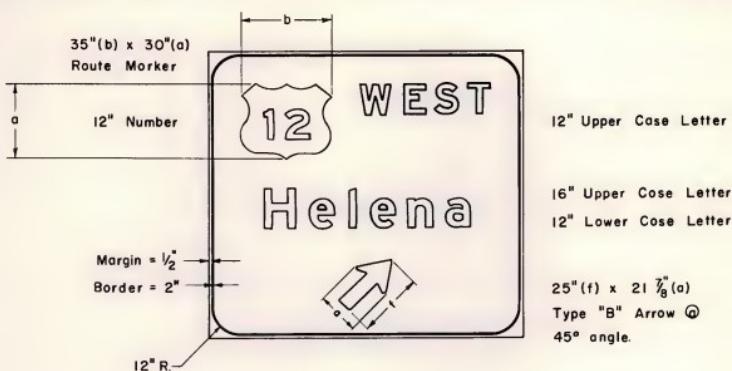
Drawn 3-1-66

REVISED  
EFFECTIVE 3-1-669-1-70  
1-1-71

STANDARD DRAWING NO. 88-36

State Highway Commission  
Helena, Montana

## TYPICAL GUIDE SIGN LAYOUT

Approved  
State Highway Engineer

## SIGN DESIGN SPECIFICATIONS

Smaller Dimension of Sign	Corner Radius
0'-0" TO 2'-6"	3"
3'-0" TO 4'-6"	6"
5'-0" TO 6'-6"	9"
7'-0" & Greater	12"

Largest Letter on Sign	Margin	Border
8" Letters or Less	$\frac{1}{2}$ "	1"
Greater Than 8"	$\frac{1}{2}$ "	2"

## NOTES

- All Interstate and U.S. Route Markers, and all Arrows used on Guide Signs must conform to those shown in the AASHO "Manual for Signing and Pavement Markings," 1961 Interstate Edition.
- All State Route Markers must conform to those shown in Standard Drawings 88-27 & 88-28.
- Guide Signs shall have white legend and border on an Interstate Green background. Legend, border, and background shall be reflectorized.
- Series "E" Letters in Type "A" or "B" demountable legend shall be used unless otherwise specified. Legends eight inches or less may be either demountable or direct applied cutout letters.
- Signs to be overlaid shall have Type "C" direct applied cutout legend and border.

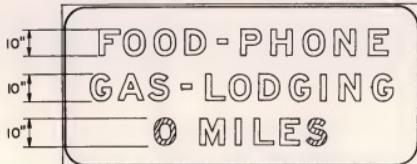


Drawn \_\_\_\_\_ Revised 9-1-70  
State Highway Commission Effective 1-1-71  
Helena, Montana

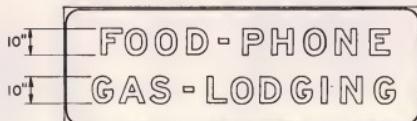
STANDARD DRAWING NO. 88-31

Approved  
State Highway Engineer

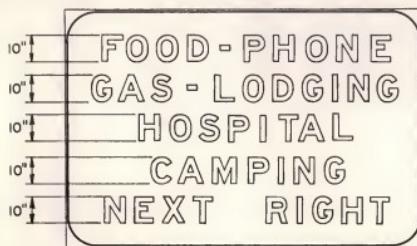
INFORMATIONAL SIGNS — SERVICES



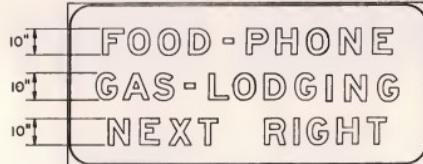
I-1  
12'-0" X 5'-6"



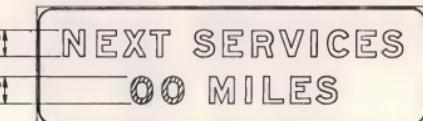
I-2  
12'-0" X 4'-0"



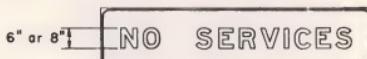
I-7  
12'-0" X 8'-0"



I-1a  
12'-0" X 5'-6"



I-6  
13'-0" X 4'-0"



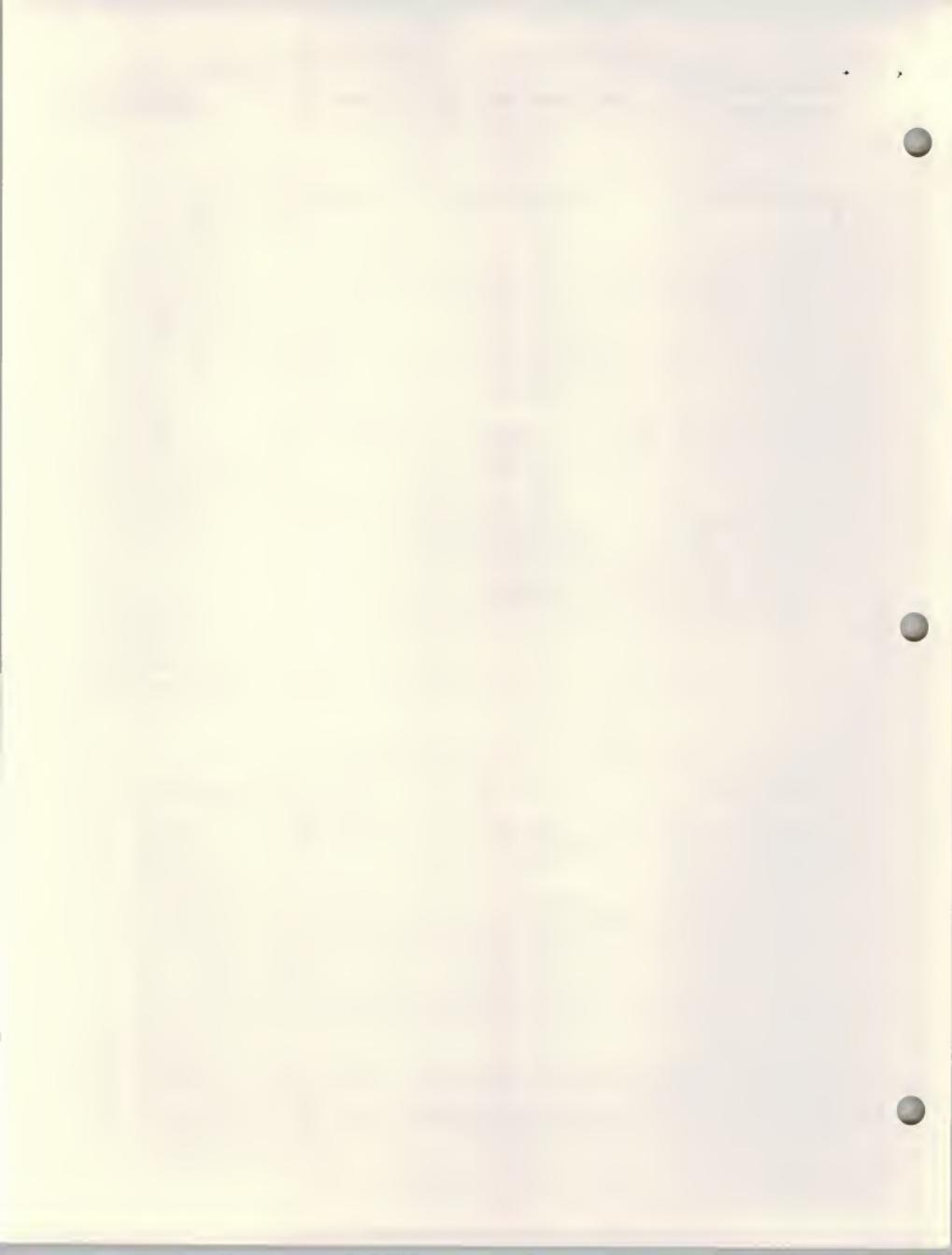
I-8  
7'-0" X 1'-6" or 9'-0" X 2'-0"

NOTES:

I-1, I-1a & I-2; If any one of the services is not available the space it normally occupies is to be left blank. See plan sheets for services to be shown.

I-8; Legend size varies according to sign location.

Service guide signs shall have white legend and border on a Interstate Blue background. Legend, border and background shall be reflectorized. Type A or B removable copy shall be used. (See Standard Specifications)



Drawn

E.S. 582 9-1-70  
E.S. 582 1-1-71

STANDARD DRAWING NO.

88-37A

State Highway Commission  
Helena, Montana

## INFORMATIONAL SIGNS - REST AREA

Approved

*Frank Buttig*  
State Highway Engineer

## NOTES:

Informational guide signs shall have white legend and border on a Interstate Blue background. Legend, border and background shall be reflectorized. Type A or B removable copy shall be used. (See Standard Specifications)



Drawn Oct. 1, 1964

REVISED 9-1-70

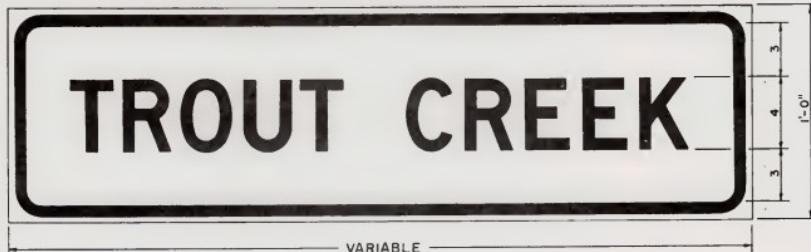
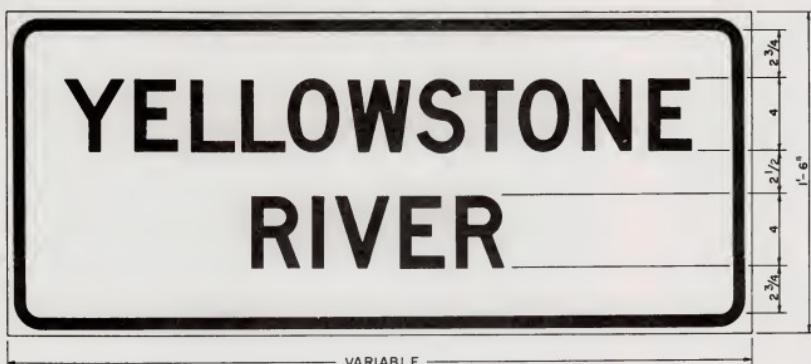
EFFECTIVE 1-1-71

STANDARD DRAWING NO.

88-38

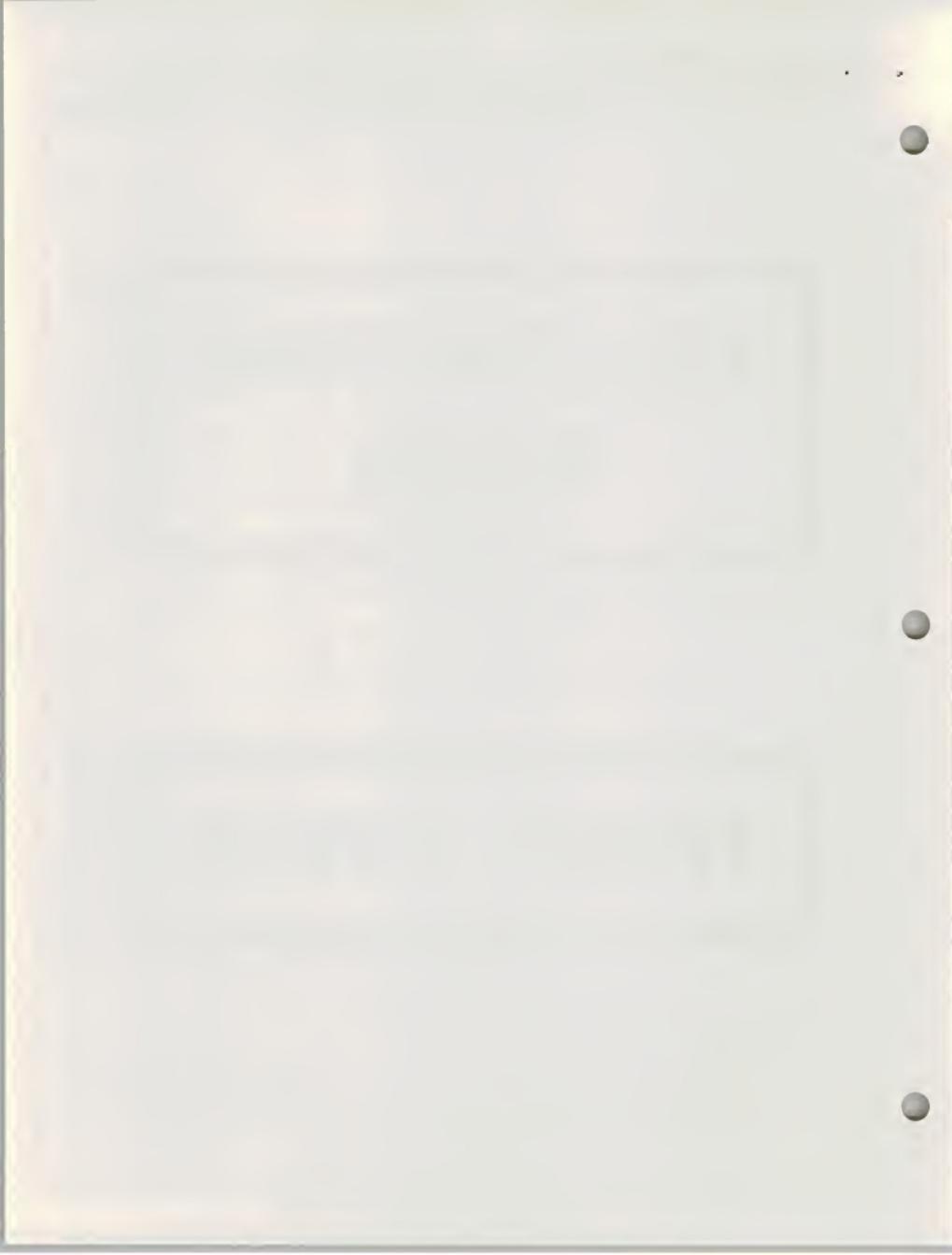
State Highway Commission  
Helena, MontanaSTANDARD N6-2 STREAM NAME SIGN  
PRIMARY & SECONDARY ROUTES

Approved

*Leonard H. Hart*  
State Highway Eng'r

## NOTES:

1. SIGN SIZE VARIES WITH LEGEND.
2. SIGNS OVER 36" WIDE SHALL HAVE 2" x 4"  
BACK BRACES.
3. SIGN FACE & LEGEND:
  - REFLECTORIZED GREEN BACKGROUND.
  - 4" SERIES 'D' REFLECTORIZED WHITE LETTERS.
  - 3/8" MARGIN.
  - 5/8" REFLECTORIZED WHITE BORDER.
  - 1 1/2" CORNER RADII.



Drawn 6-24-68

Revised 6-24-68  
Effective 7-1-69 8-1-70

STANDARD DRAWING NO. 88-39

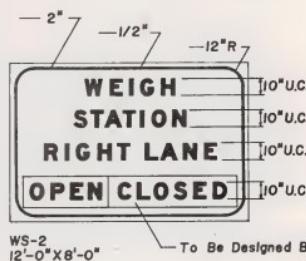
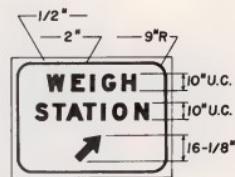
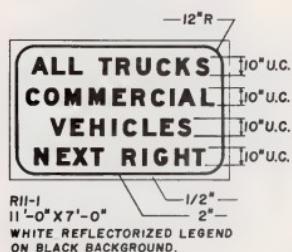
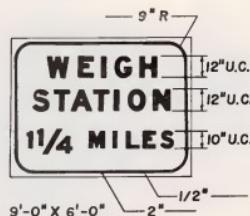
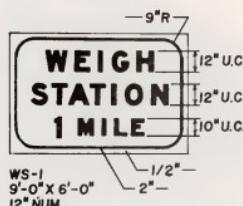
State Highway Commission  
Helena, Montana

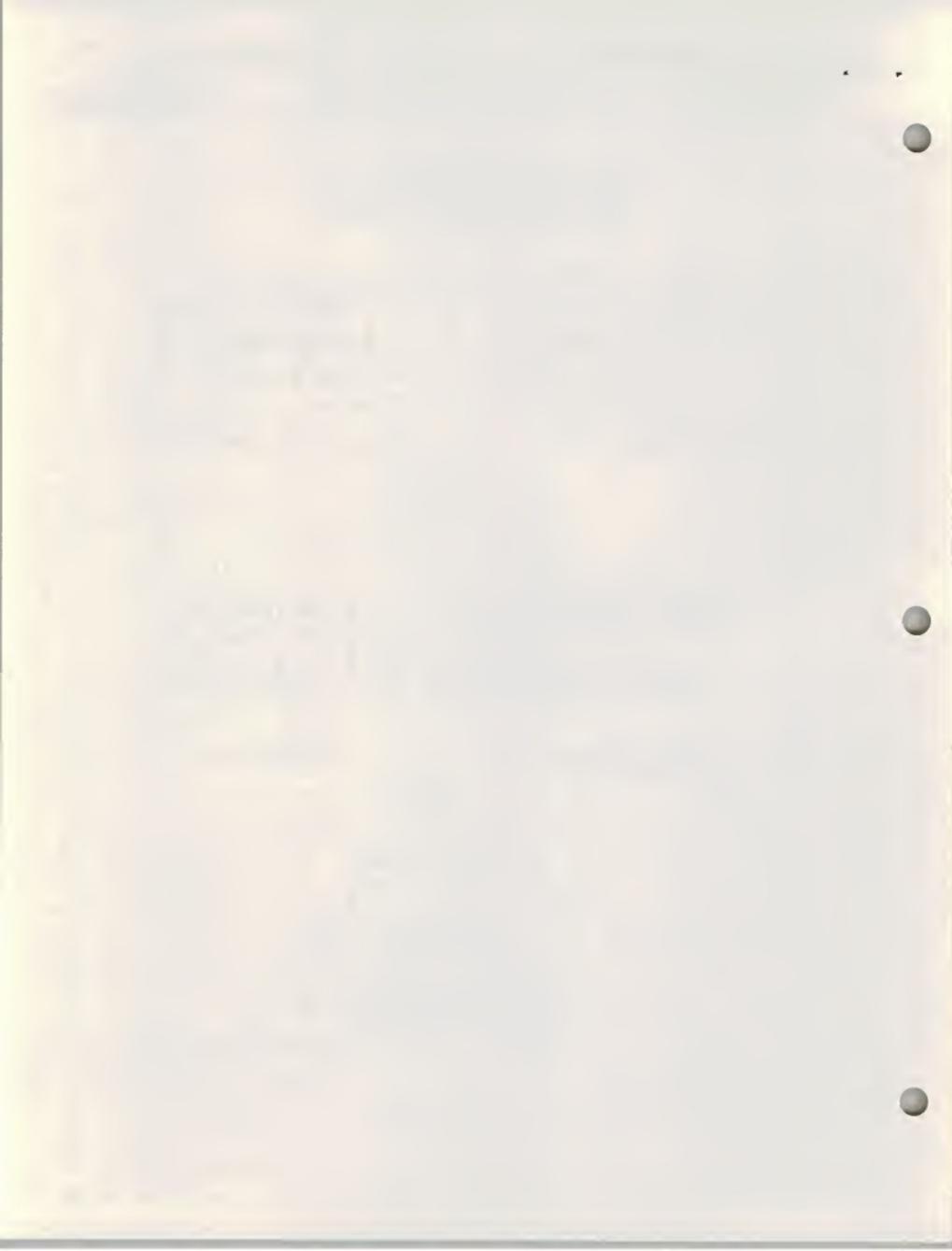
## WEIGH STATION SIGNS

Approved  
State Highway Engineer

## NOTE

WEIGH STATION GUIDE SIGNS SHALL HAVE WHITE LEGEND AND BORDER ON INTERSTATE GREEN BACKGROUND. LEGEND, BORDER, AND BACKGROUND SHALL BE REFLECTORIZED. TYPE A,B REMOVABLE COPY SHALL BE USED. (SEE STANDARD SPECIFICATIONS).





Drawn 9-1-64

Revised 1-1-68  
Effective 4-1-689-1-70  
1-1-71

STANDARD DRAWING NO. 88-47

State Highway Commission  
Helena, Montana

## STANDARD REST AREA &amp; INFORMATION SIGNS

Approved

F. M. Schlesinger, P.E.  
State Highway Engineer

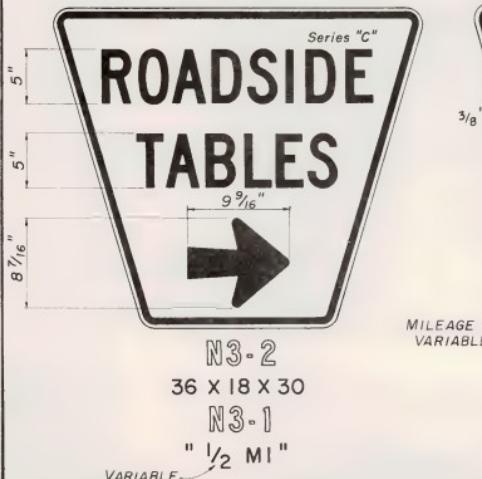
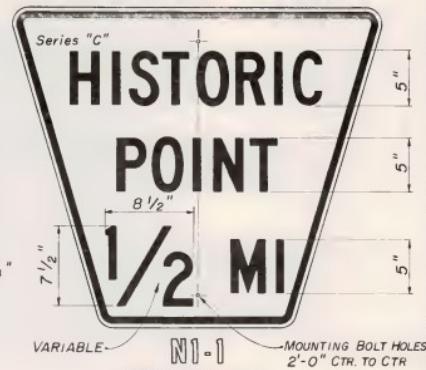
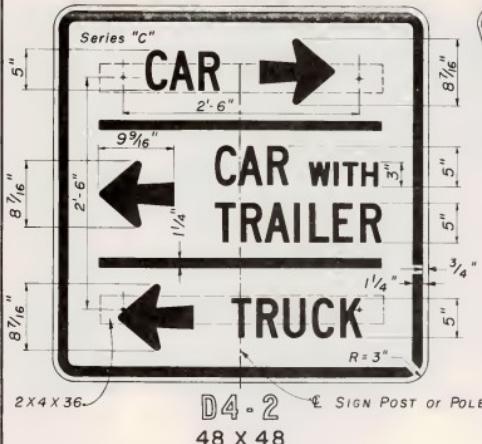
## NOTES:

1. ALL SIGNS ON THIS PAGE SHALL HAVE GREEN LEGEND AND BORDERS ON A WHITE REFLECTORIZED BACKGROUND.

2. ALL DIRECTIONAL ARROWS SHALL BE THE INTER-STATE TYPE "B" ARROW,  $9\frac{9}{16}$ " X  $8\frac{7}{16}$ ".

3. SEE D4-2 & NT-1 FOR TYPICAL SIGN PANEL DETAILS. (BORDER, MARGIN, ETC.)

4. SIGNS ON THIS PAGE ARE TYPICAL SIGNS. SEE PLAN SHEETS FOR ACTUAL SIGN LAYOUTS.





Drawn 6-1-65

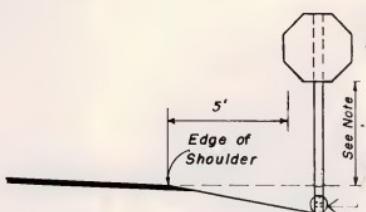
Revised 11-1-68 9-1-70  
Effective 11-1-69 1-1-71

STANDARD DRAWING NO. 88-57

State Highway Commission  
Helena, MontanaApproved  
John C. Miller, P.E.  
State Highway Engineer

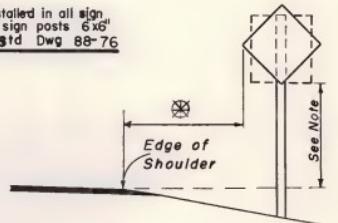
## TYPICAL SIGN ERECTION

## FOR REGULATORY &amp; WARNING SIGNS

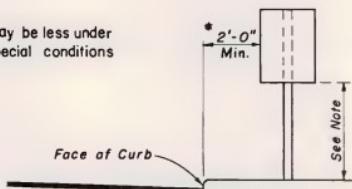


FOR ALL STOP SIGNS

Slot shall be installed in all sign poles and in all sign posts 6x6" or larger. See std. Dwg. 88-76



\* May be less under  
special conditions



FOR CURBED SECTION

## NOTE + MOUNTING HEIGHTS

Rural 5.0' Min.

Urban 7.0' Min.

Roads with Four or  
more traffic lanes,  
Interchange ramps  
and Crossroads 6.0' Min.



DEMNIN 3-1-67

Revised 1-1-68

11-28-69 9-1-70

EFFECTIVE 6-1-67

Effective 1-1-68

1-1-70 1-1-71

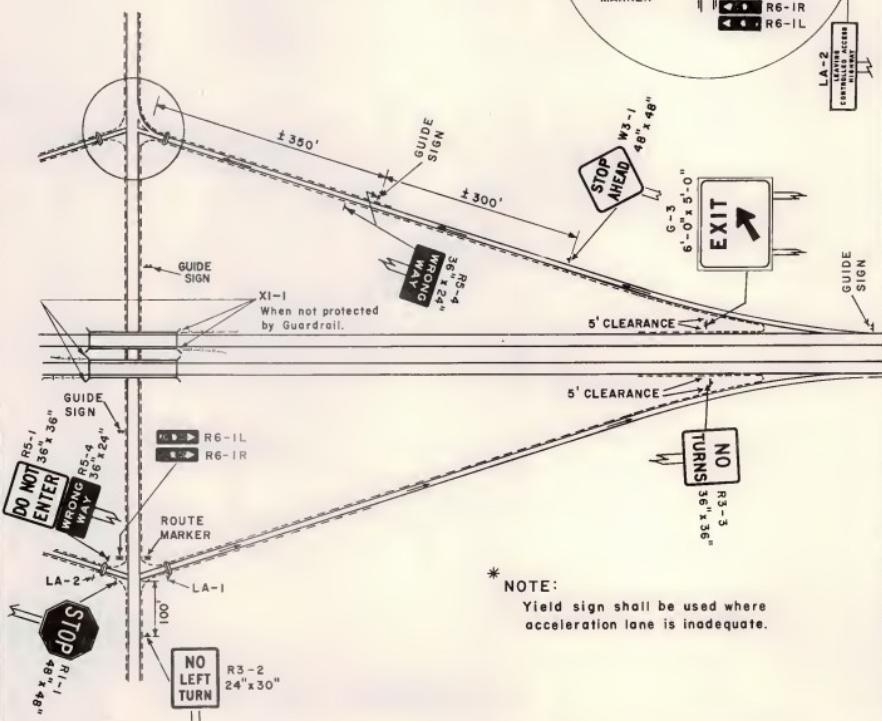
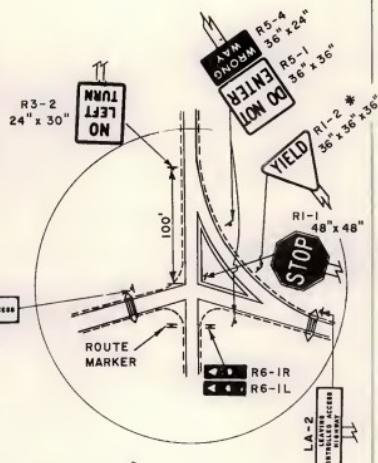
STANDARD DRAWING NO. 88-58

State Highway Commission  
Helena, Montana

## TYPICAL CROSSROAD &amp; RAMP LAYOUT

Approved  
State Highway EngineerR5-4  
36" x 24"

5"  
5"  
Series F  
4"  
5"  
Series F  
5"



## \* NOTE:

Yield sign shall be used where acceleration lane is inadequate.



DRAWN 3-1-67  
EFFECTIVE 6-1-67

Revised 11-1-68 9-1-70  
Effective 1-1-69 1-1-71

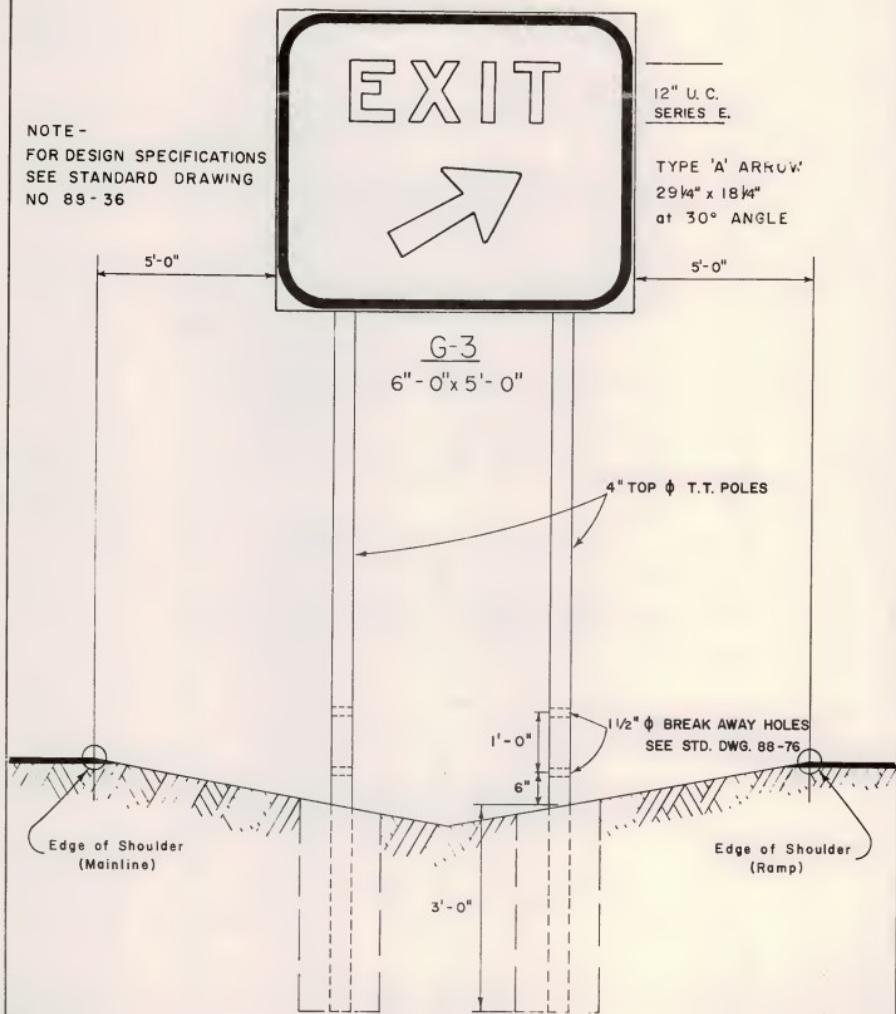
STANDARD DRAWING NO. 88-66

State Highway Commission  
Helena, Montana

STANDARD GUIDE SIGNS

Approved  
State Highway Eng. Dept.

NOTE -  
FOR DESIGN SPECIFICATIONS  
SEE STANDARD DRAWING  
NO 88-36

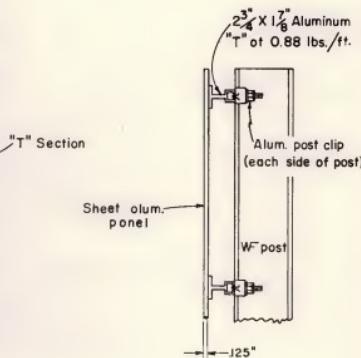
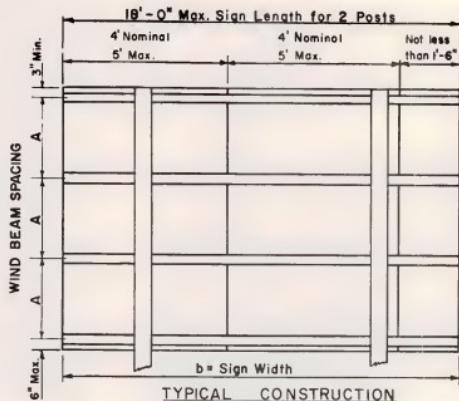




Drawn 6-1-65

Revised 3-1-67 9-1-70  
Effective 6-6-67 1-1-71

STANDARD DRAWING NO. 88-68

State Highway Commission  
Helena, MontanaALUMINUM SHEET INCREMENT  
GUIDE SIGNSApproved  
John C. Carlson  
State Highway EngineerNOTE:

Signs less than 4'-0" high and 8'-0" long will be made of a single sheet of aluminum. Signs up to, and including, 8'-0" high will have no horizontal joints and no sheet shall be less than 1'-6" wide.

Signs over 8'-0" high may have horizontal and vertical joints; however, no sheet shall be less than 1'-6" wide or 1'-6" high.

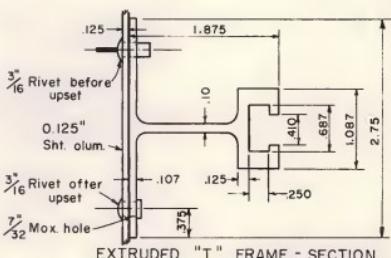
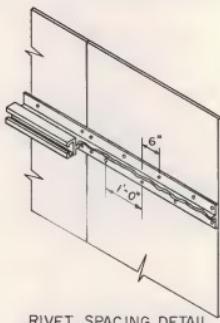
Tighten post clip nuts to 225<sup>in</sup> lbs torque using dry, clean threads.

No splices are allowed in extruded "T" sections.

All horizontal joints must occur at "T" sections.

All sheet aluminum shall be 0.125 thick.

Short width panels shall be placed on inside edge next to shoulder.

NOTE:

Rivets 6" apart staggered from one side to another on horizontal extruded frame section.

Rivets doubled (both sides of extruded frame) at horizontal and vertical joints in sheet aluminum face and at ends of extruded T-section.

**WIND BEAM CHART**

WIND BEAM SPA. "A"	b MAX.		.20 b MAX.		.15 b MAX.		.60 b MAX.		.35 b MAX.	
	2 POST	3 POST	2 POST	3 POST	2 POST	3 POST	2 POST	3 POST	2 POST	3 POST
1-8	18-0	27-0	3-7	4-1	10-10	9-5				
1-10	17-0	25-8	3-5	3-10	10-2	9-0				
2-0 MAX.	16-6	24-6	3-4	3-8	9-10	8-7				



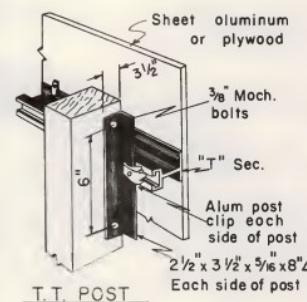
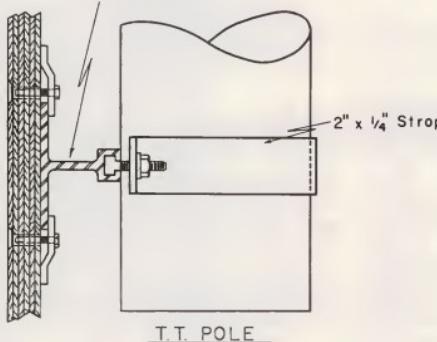
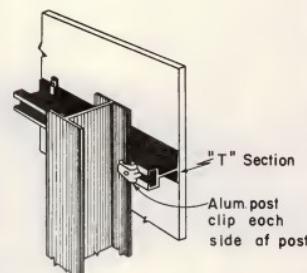
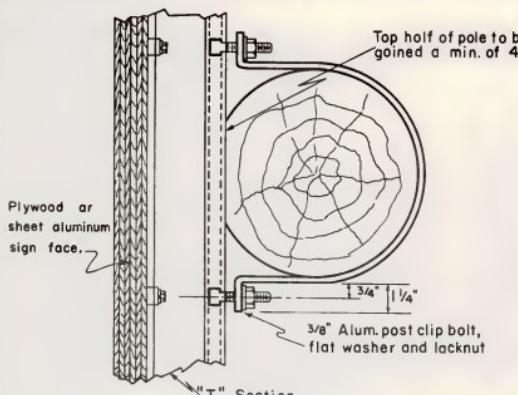
Drawn 6-1-65

Revised 4-7-68 8-1-70  
Effective 4-7-68 8-1-70

STANDARD DRAWING NO. 88-70

State Highway Commission  
Helena, Montana

## GUIDE SIGN MOUNTING DETAILS

Approved  
*[Signature]*  
State Highway EngineerNOTE:

1. Mounting systems shown are typical. Other systems may be approved by the engineer.
2. All steel hardware shall be galvanized.



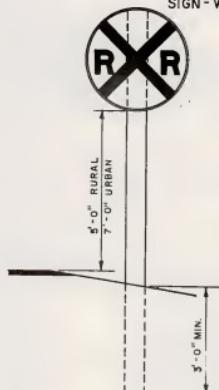
Drawn 1-1-56

Revised 11-1-68 9-1-70  
Effective 1-1-69 1-1-71

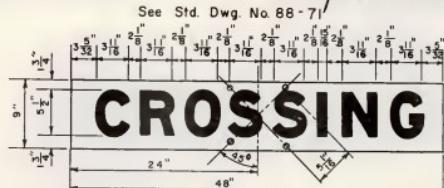
STANDARD DRAWING NO. 88-72

State Highway Commission  
Helena, Montana

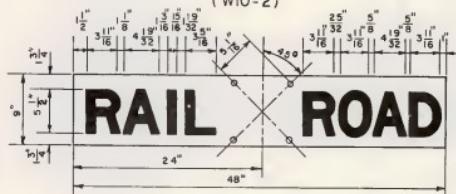
## RAILROAD CROSSING SIGNS

Approved  
*[Signature]*  
State Highway EngineerADVANCE WARNING  
SIGN-WIO-1

See Std. Dwg. No. 88-71



(WIO-2)

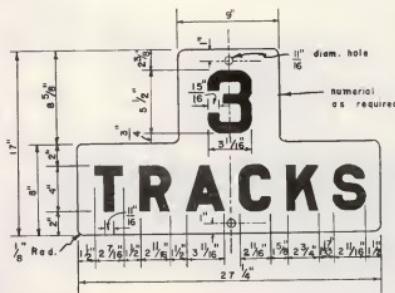
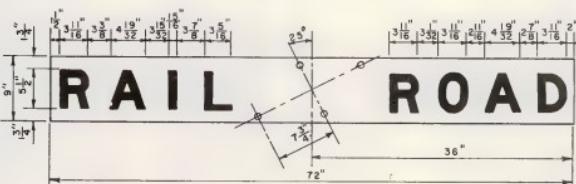
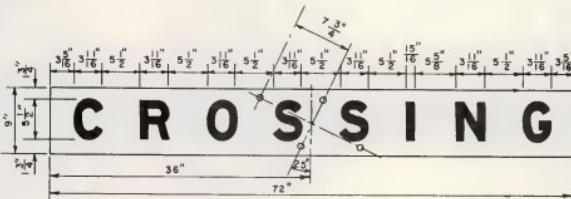


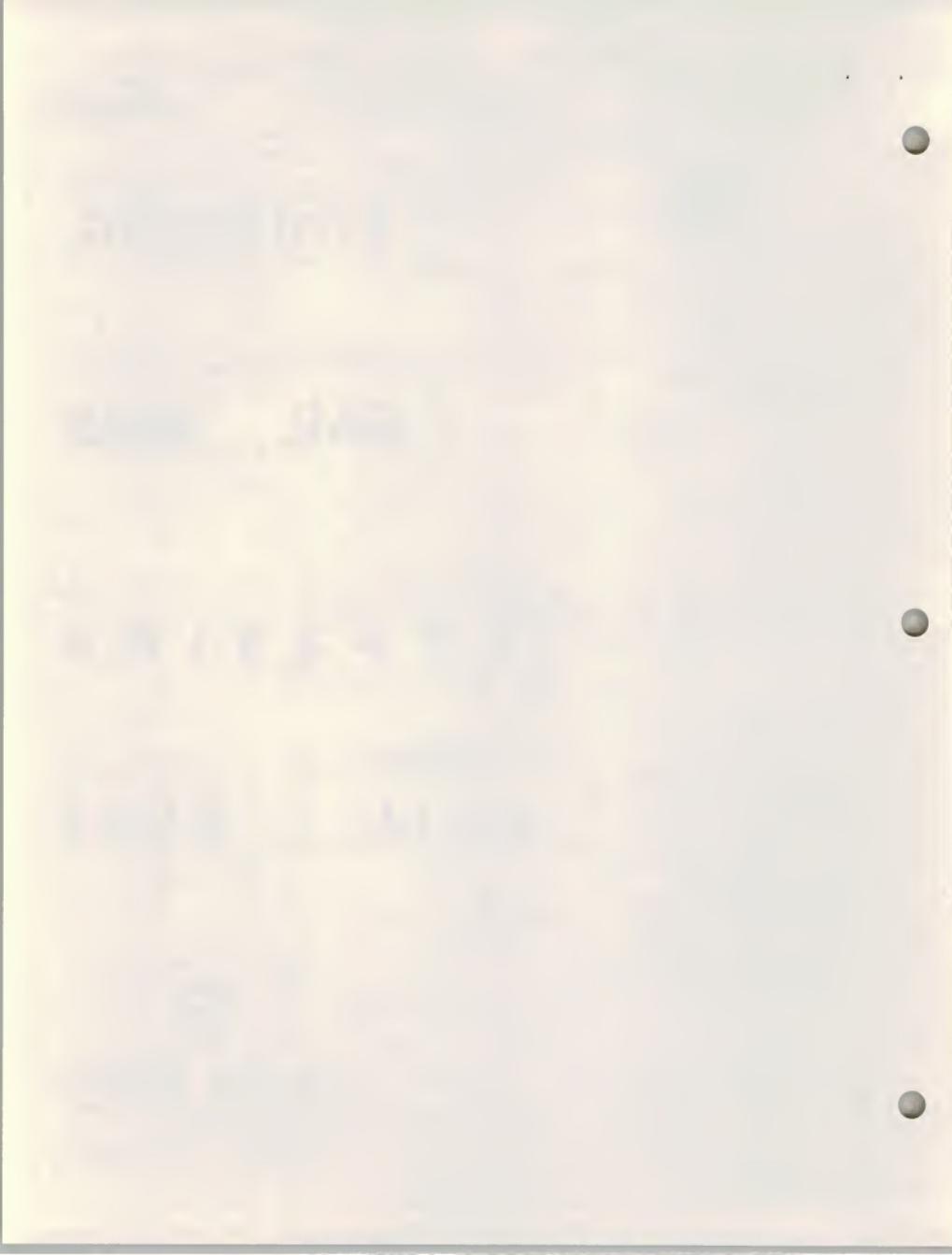
The Advance Warning Signs shall be the standard WIO-1 36" diameter sign shown in the Manual on Uniform Traffic Control Devices for Streets and Highways. It shall have block legend on a reflectorized yellow background. The sign shall be constructed of 6061-T6 aluminum sheet, 0.100 inch minimum thickness. Fabrication shall conform with the Standard Specifications.

The WIO-1 sign shall be erected with a 10 ft horizontal clearance from the edge of the shoulder or face of the curb. The mounting height to the bottom of the sign shall be 5 ft in rural areas and 7 ft in urban areas.

In rural areas a treated timber pole or post (break-away design) shall be used. See Std. Dwg. 88-76. In urban areas a 2½" diameter pipe post using the breakaway device as shown on sign standard No. 10.

Bolts shall be  $\frac{5}{16}$ " aluminum, galvanized steel or cadmium plated steel, lengths as required.





Drawn 3-1-63

REVISED 3-1-66 11-28-65 9-1-70  
EFFECTIVE 3-1-66 1-1-70 1-1-71

STANDARD DRAWING NO. 88-74

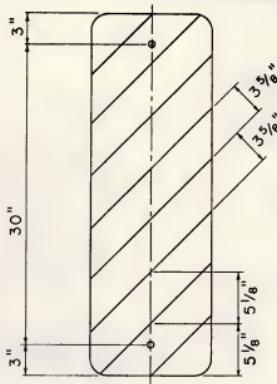
State Highway Commission  
Helena, Montana

## X1-1 SIGN &amp; ERECTION DETAIL

Approved

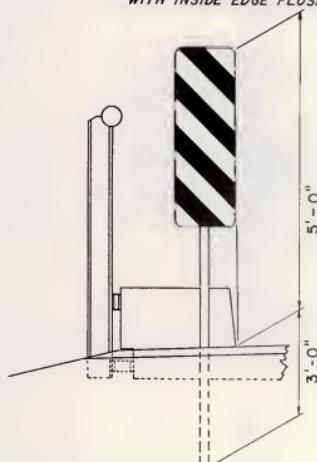
F. J. [Signature] 4-2-66  
State Highway Engineer

12" X 36"



## NOTE:

STRIPES SHALL BE BLACK AND REFLECTORIZED WHITE.  
PANELS SHALL BE MOUNTED ON GALVANIZED STEEL T-POSTS 2LBS./FT.  
WITH INSIDE EDGE FLUSH WITH FACE OF CURB.





Revised 1-1-67  
Effective 1-1-67  
State Highway Commission  
Helena, Montana

Revised 1-1-67  
Effective 1-1-67

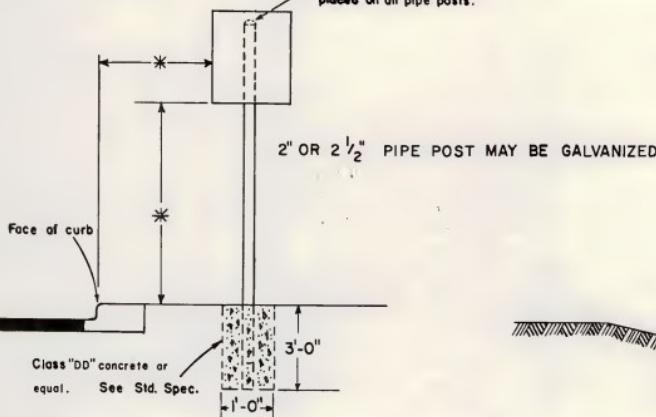
STANDARD DRAWING NO. 88-75

Approved  
State Highway Engineer

## TYPICAL PIPE POST MOUNTING DETAIL

\* For Erection Details see  
Std. Drawing 88-57

A Suitable water-tight cap to be  
placed on all pipe posts.

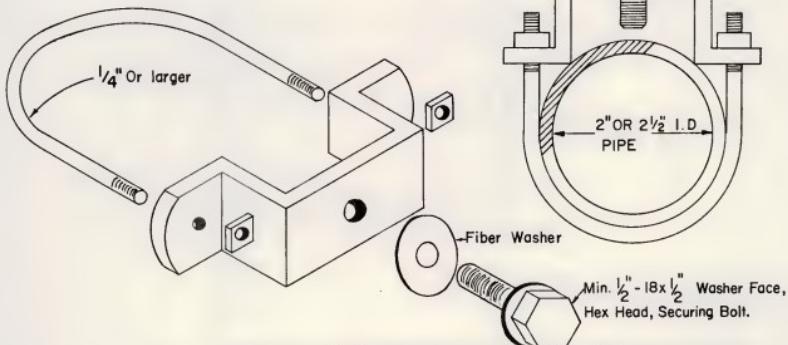


### CURB MOUNTING

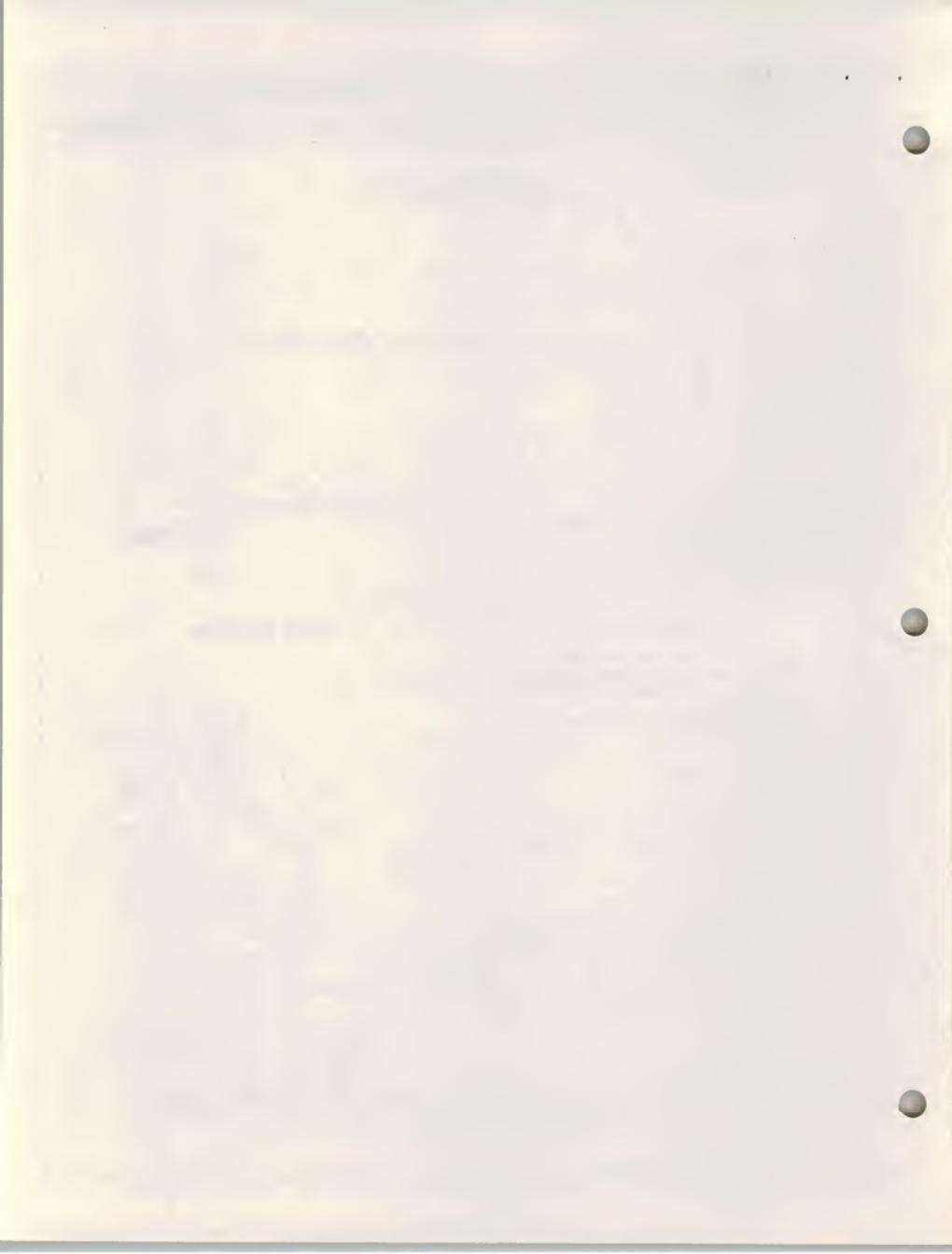
NOTE: For back to back sign installation, two "U" brackets will be required using two  $2\frac{1}{2}'' \times \frac{1}{4}''$  carriage bolts in place of "U" bolt.

All hardware shall be cadmium plated or galvanized.

### SLOPE MOUNTING



TYPICAL "U" BRACKET FOR 2" OR 2 1/2" PIPE POST



Drawn 3-1-68

Revised 7-1-68 9-1-70

Effective 7-1-68 9-1-70

STANDARD DRAWING NO. 88-76

State Highway Commission  
Helena, Montana

Approved:

*Lester M. Bell*  
State Highway Engineer

## WOOD POLE SLOT DETAIL

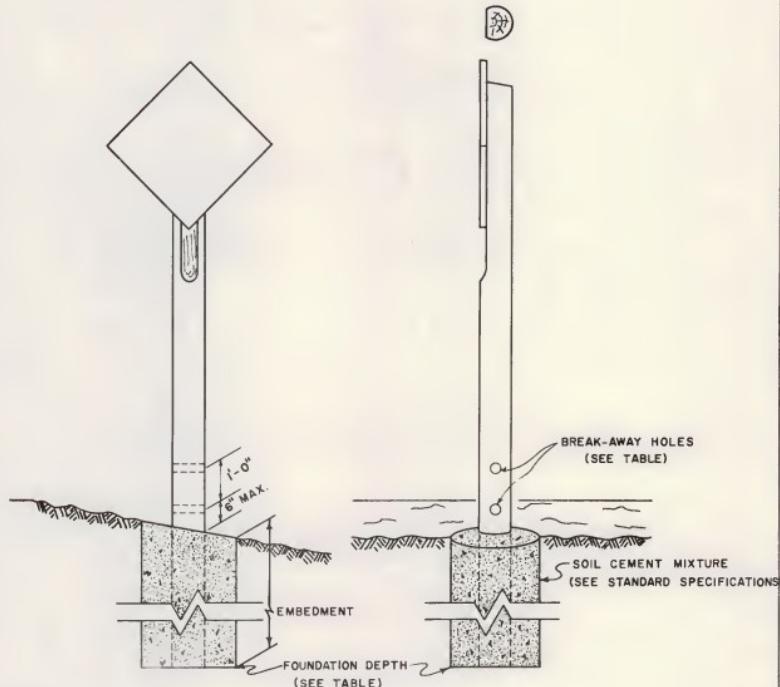
STANDARD BREAK AWAY DETAIL  
SINGLE OR MULTIPLE ROUND TIMBER POLES

TABLE OF DIAMETERS & FOUNDATIONS		
POLE SIZE	HOLE DIA.	EMBEDMENT
3" TOP Ø	—	3'-0"
4" TOP Ø	1 1/2"	3'-0"
5" TOP Ø	1 7/8"	3'-6"
6" TOP Ø	2 1/8"	3'-6"
CLASS 4	2 1/2"	4'-0"
CLASS 3	2 5/8"	4'-0"

## NOTES:

ALL CUTTING, TRIMMING AND BORING  
OF TREATED TIMBER POLES SHALL BE  
IN ACCORDANCE WITH STANDARD SPECIFICATIONS.

TREATED TIMBER POSTS, 4"X4" OR 4"X6"  
WILL NOT REQUIRE HOLES FOR BREAKAWAY DESIGN.



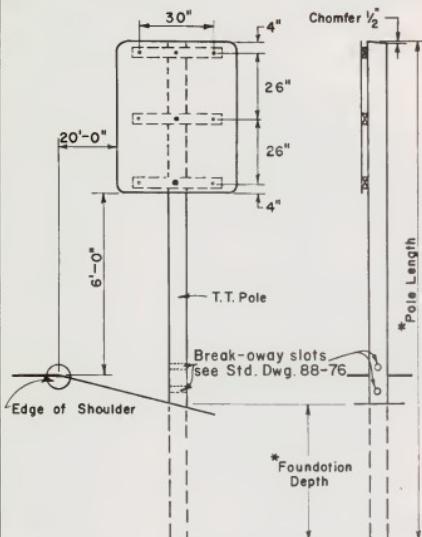
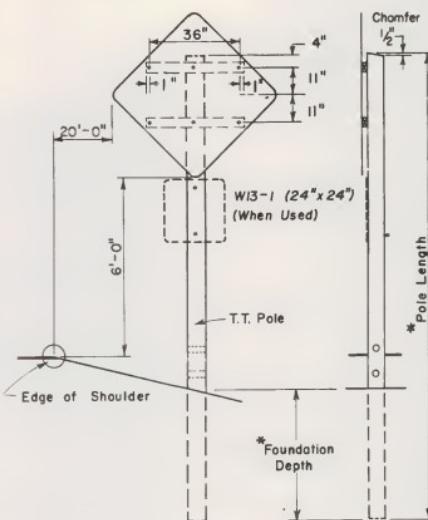
Drawn 3-1-66

Revised 11-1-68 9-1-70  
Effective 1-1-69 1-1-71

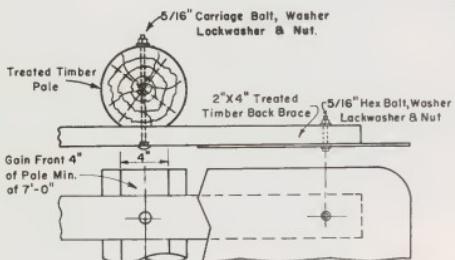
STANDARD DRAWING NO. 88-77

State Highway Commission  
Helena, Montana

## TYPICAL SIGN ERECTION

Approved  
John C. Stoen  
State Highway EngineerTYPICAL ERECTION  
48" x 60" REGULATORY SIGNTYPICAL ERECTION  
48" x 48" WARNING SIGN

\* For Pole Lengths and Foundation Depth-See Sign Plans "Sign Location and Erection" Sheet. For details see Std. Dwg. 68-76



## NOTE:

Signs greater than 10 sq. ft. shall be mounted 2' from shoulder edge. Caution should be taken to avoid placing signs in a position where it is not easily visible to the motorist.

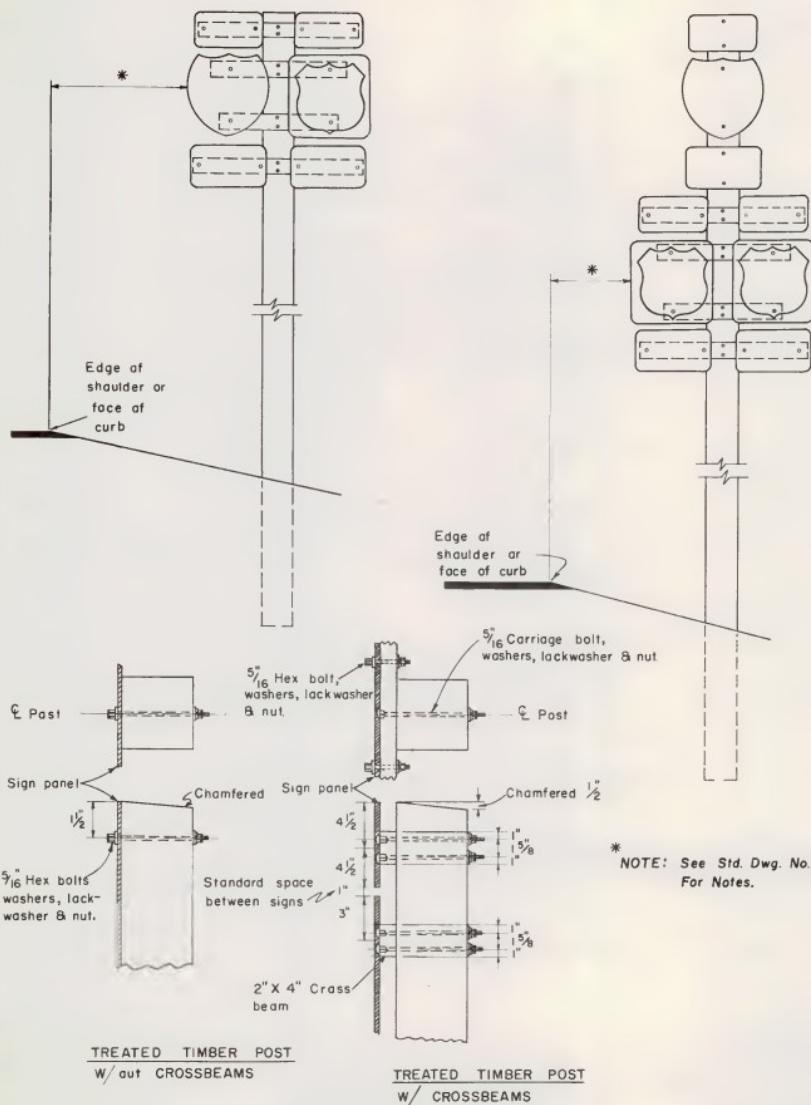
SIGN FASTENING AND BACK BRACE DETAILS



Drawn 6-1-65

Revised 7-1-68 9-1-70  
Effective 7-1-69 1-1-71

STANDARD DRAWING NO. 88-78

State Highway Commission  
Helena, MontanaTYPICAL ROUTE MARKER ASSEMBLY  
WITH TREATED TIMBER POSTApproved  
[Signature]  
State Highway Engineer  
6-67



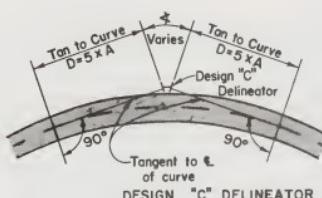
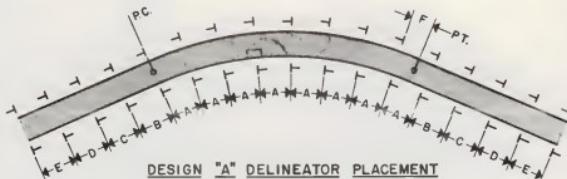
Drawn 5-1-65

REVISED 11-1-68 EFFECTIVE 1-1-70  
1-1-71

STANDARD DRAWING NO. 88-92c

State Highway Commission  
Helena, MontanaDELINERATOR SPACING FOR  
HORIZONTAL HIGHWAY CURVES

Approved

Gerald G. Miller P.E.  
State Highway Engineer

Place Design "C" Delineators on curves sharper than  $7^{\circ} 30'$ . Position delineator faces perpendicular to tangent to center line of curve as shown. Spacing shall be as called for in Table below.

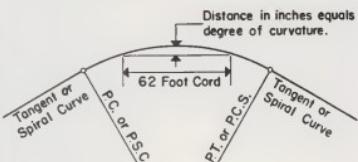
HORIZONTAL CURVE SPACING TABLE					
DEGREE OF CURVE	SPACING "A" ON CURVE	SPACING ON BOTH APPROACHES			
		B	C	D	E
0° TO 30'	200'	264'	264'	264'	264'
30° TO 1°	175'	264'	264'	264'	264'
1° TO 2°	125'	225'	264'	264'	264'
2° TO 3°	95'	170'	264'	264'	264'
3° TO 4°	80'	145'	240'	264'	264'
4° TO 6°	70'	125'	210'	264'	264'
6° TO 8°	55'	100'	165'	264'	264'
8° TO 12°	45'	80'	135'	264'	264'
12° TO 20°	35'	65'	115'	210'	264'
20° PLUS	25'	45'	75'	150'	264'

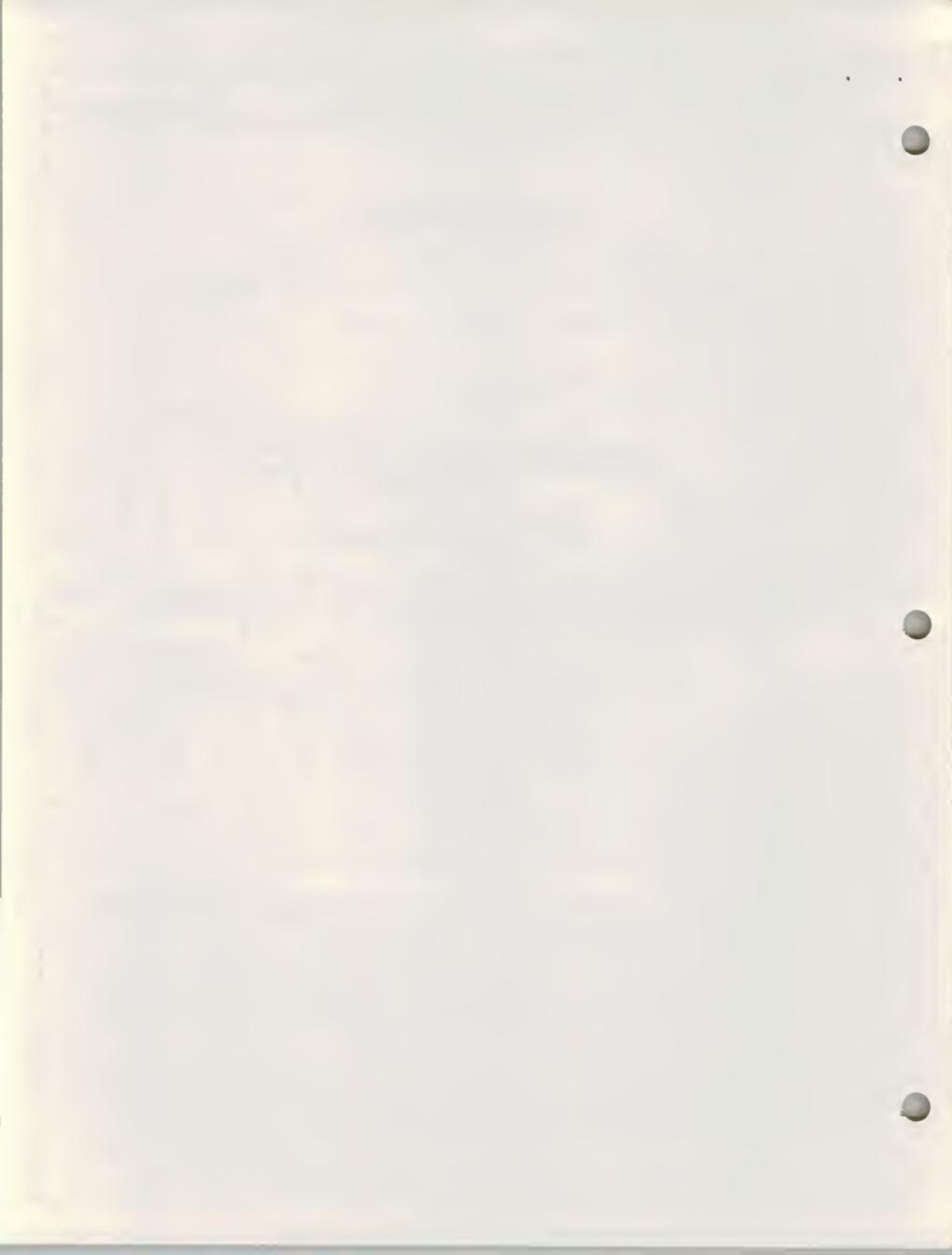
## NOTES:

- If distance F is 20 feet or more, add one regular "A" space as called for in the above table.
- See Standard Drawing No. 88-91 for Delineator Design Details.
- Post with delineators shall be placed on the right hand side facing oncoming traffic, 2'-0" clear from edge of shoulder or the face of curb, or as shown on the plans.
- Type I Delineator button shall be a nominal 3" diameter reflector as specified by Standard Specifications.
- Delineator spacing on Tangent, shall be 264', unless otherwise noted on project plans.
- Interstate highways shall be continuously delineated.

- Interstate highways with split alignments shall be delineated on the inside shoulder at double the normal spacing.
- Posts shall be installed behind guard rail posts where there is guard rail installed along the highway.
- Where, under normal spacing, a delineator post falls within a crossroad, that post may be moved in either direction a distance not to exceed one quarter of the normal spacing.
- Primary & secondary highways may be continuously delineated in areas where ground blizzards are prevalent or in areas of hazardous alignment; otherwise, curves of 4° and sharper shall be delineated on the outside of the curve. Where vertical alignment is rolling, horizontal curves less than 4° may require delineation.

## FIELD METHOD FOR DETERMINING DEGREE OF HORIZONTAL CURVES





Drawn 8-14-70

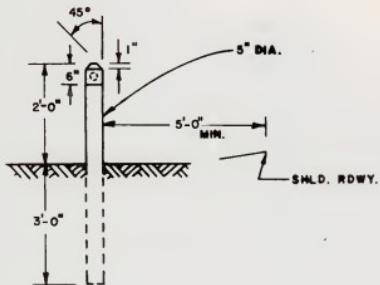
— (n=1-7)

STANDARD DRAWING NO. 90-00

State Highway Commission  
Helena, Montana

5" - WOOD GUIDE POST

Approved  
John P. Butterfield  
State Highway Engineer



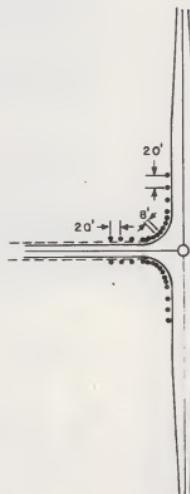
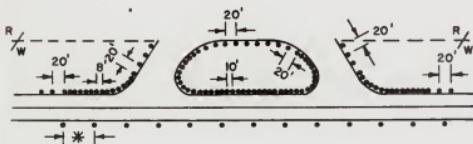
**NOTES:**

GUIDE POSTS TO BE OF 5" DIAMETER.  
WOOD POLE THAT CONFORMS TO THE APPLICABLE  
PROVISIONS OF THE STANDARD SPECIFICATIONS  
FOR ROAD & BRIDGE CONSTRUCTION.  
THE POLE SHALL BE TREATED IN SUCH A  
MANNER & WITH SUCH PRESERVATIVES THAT  
WILL ALLOW PAINT TO READILY ADHERE  
WITHOUT DISCOLORATION. (M-270.06(A)).  
THE PORTION ABOVE GROUND SHALL BE  
PAINTED WITH TWO COATS OF WHITE PAINT  
(M-280.01). REFLECTORIZING OF GUIDE  
POSTS, IF REQUIRED IN PLAN SPECIFICATIONS,  
CAN BE ACCOMPLISHED BY APPLYING WHITE  
REFLECTORIZING PAINT ON TOP 6 INCH  
PORTION -OR- INSTALLATION OF DELINEATOR  
CRYSTALS AS SPECIFIED.

**POST SPACING TO BE AS FOLLOWS:**

RADI	SHLD. TANG.	R/W TANG.
B' C TO C	10' C TO C	20' C TO C

\* DISTANCE VARIES - WILL BE NOTED  
IN PLANS





REVISED	4-15-68	11-22-68	4-4-69	11-1-70
EFFECTIVE	1-1-68	1-1-69	7-1-69	1-1-71

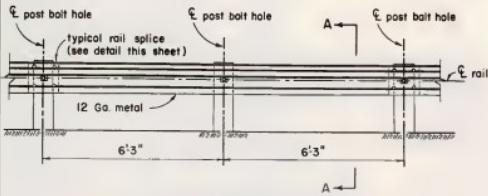
**STANDARD DRAWING NO. 90-02**

STATE HIGHWAY COMMISSION  
HELENA, MONTANA

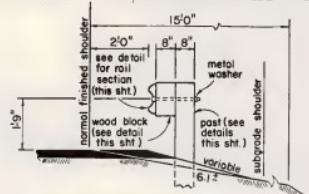
## METAL GUARD RAIL

APPROVED

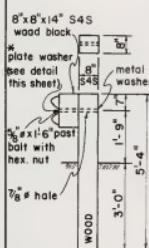
**STATE HIGHWAY ENGINEER**



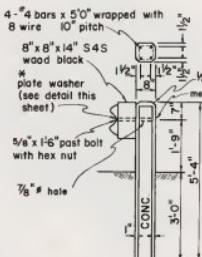
## METAL GUARD RAIL



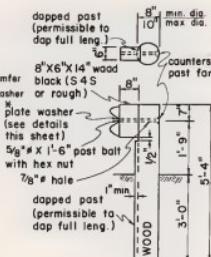
**SECTION A-A**



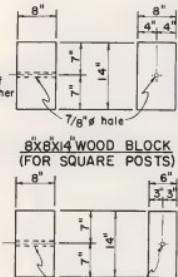
### SQUARE WOOD POST



## **CONCRETE POST**

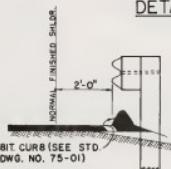


### **ROUND WOOD POST**

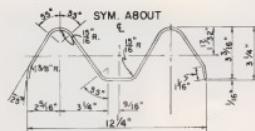


7/8" # hole  
8" x 6" x 14" WOOD BLOCK  
(FOR ROUND POSTS)

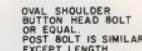
### DETAIL OF GUARD RAIL POSTS



BITUM. CURB  
WITH GUARD RAIL

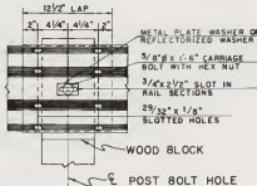


## RAIL SECTION



WASHER TO BE PLACED BETWEEN  
HEAD AND RAIL OF POST BOLT.  
USE ON POST CONNECTIONS THAT  
DO NOT USE REFLECTORS.

**PLATE  
WASHER DETAIL**



RAIL SPLICE DETAIL  
(LAP IN DIRECTION OF TRAFFIC)

## NOTES

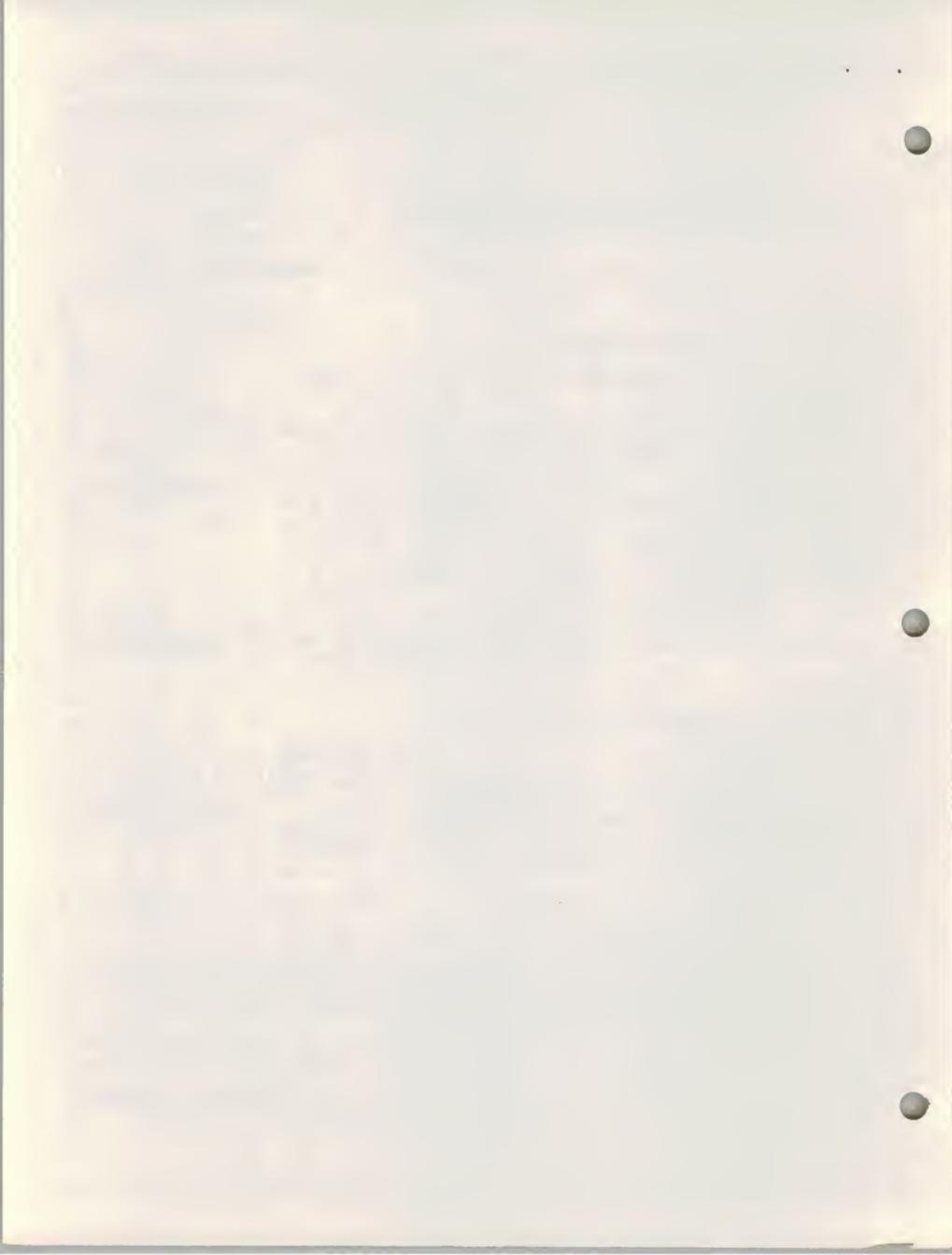
**RAIL** GALVANIZED RAIL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 93 OR ASTM A 123. STEEL RAIL SHALL CONFORM TO ASSHO M 180. ALL RAIL PLATES ARE TO BE LAPPED IN DIRECTION OF TRAFFIC

**POSTS:** ROUND POSTS SHALL HAVE NO DIAMETER LESS THAN 8" OR MORE THAN 10". ONLY ONE TYPE POST (SQUARE OR ROUND) TO BE USED WITHIN ONE PROJECT.

TERMINAL SECTIONS: SEE STANDARD DRAWING NO. 90-05, NO. 90-06 AND NO. 90-07 FOR APPROACH AND DEPARTURE TERMINAL SECTIONS.  
BRIDGE APPROACH: SEE STANDARD DRAWING NO. 90-04 FOR TREATMENT AT BRIDGE ENDS.

REFLECTOR-WASHER. ALL SECTIONS OF GUARD RAIL SHALL HAVE REFLECTOR-WASHERS SPACED EVENLY OF AT SEE STANAGRE DRAWING NO.

FLECTOR WASHERS SPACED EVERY 25 FT. SEE STANDARD DRAWING NO. 90-08 FOR DETAILS.



REVISED 11-1-70  
EFFECTIVE 1-1-71

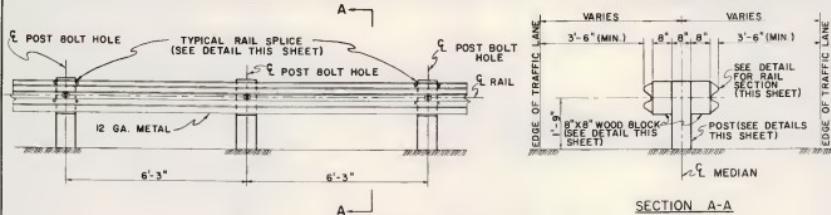
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

STANDARD DRAWING NO. 90-03

# METAL MEDIAN RAIL

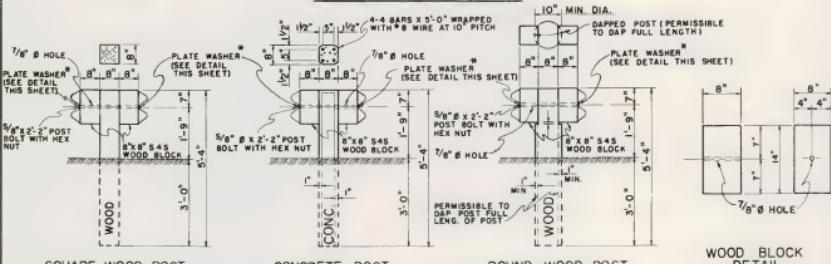
APPROVED

STATE HIGHWAY ENGINEER



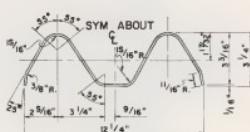
SECTION A-A

## METAL BEAM MEDIAN RAIL

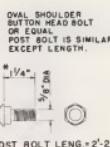


\* USE REFLECTOR WASHERS IN PLACE OF PLATE WASHER AS NOTED ON STANDARD DRWG. 90-08

## DETAIL OF GUARD RAIL POSTS



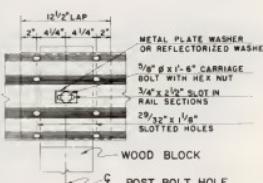
RAIL SECTION



SPlice BOLT & NUT

WASHER TO BE PLACED BETWEEN HEAD OF RAIL AND HEAD OF POST BOLT. USE ONE REFLECTOR WASHER THAT DO NOT USE REFLECTOR WASHER. USE ON BOTH SIDES OF MEDIAN RAIL.

## PLATE WASHER DETAIL



RAIL SPLICE DETAIL  
(LAP IN DIRECTION OF TRAFFIC)

**RAIL:** GALVANIZED RAIL SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 93 OR ASTM A 123. STEEL RAIL SHALL CONFORM TO AASHO M 180. ALL RAIL PLATES ARE TO BE LAPPED IN DIRECTION OF TRAFFIC.

**POSTS:** ROUND POSTS SHALL HAVE NO DIAMETER LESS THAN 10". ONLY ONE TYPE POST (SQUARE OR ROUND) TO BE USED WITHIN ONE PROJECT.

**TERMINAL SECTIONS:** SEE STD. DRWG. NO. 90-05, 90-06 AND NO. 90-07 FOR APPROACH AND DEPARTURE TERMINAL SECTIONS.

**BRIDGE APPROACH:** SEE STD. DRWG. NO. 90-04 FOR TREATMENT AT BRIDGE ENDS.

**REFLECTOR WASHER:** ALL SECTIONS OF GUARDRAIL SHALL HAVE REFLECTOR-WASHERS SPACED EVERY 25 FT. SEE STD. DRWG. NO. 90-08 FOR DETAILS.



REVISED 11-1-70  
EFFECTIVE 1-1-71

STANDARD DRAWING NO. 90-04

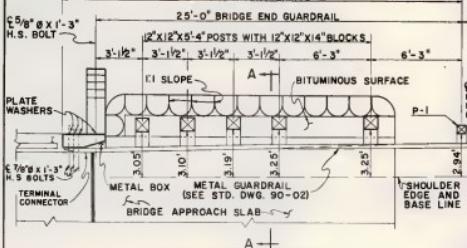
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

BRIDGE END TREATMENT

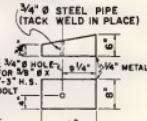
APPROVED

STATE HIGHWAY ENGINEER

27'-5" PAYMENT LIMITS

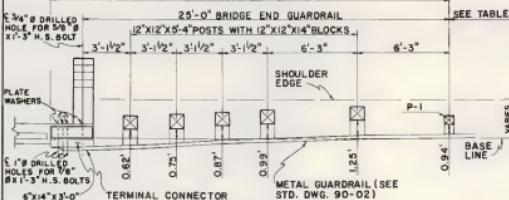


SEE TABLE "A"

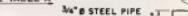


BRIDGE END-TYPE 1  
(USE FOR NEW BRIDGES ONLY)

27'-5" PAYMENT LIMITS

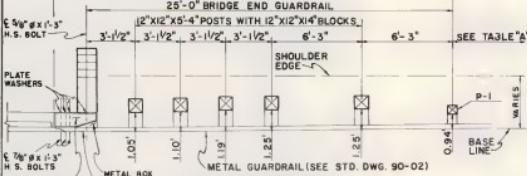


SEE TABLE "A"



BRIDGE END-TYPE 2  
(EXISTING ANCHOR POST IN PLACE)

27'-6" PAYMENT LIMITS

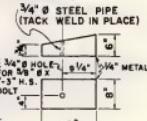


SEE TABLE "A"

BRIDGE END-TYPE 3

TERMINAL CONNECTOR (NO ANCHOR POST PROVIDED ON EXISTING BRIDGE)

SEE TABLE "A"



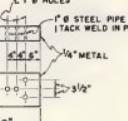
1" H HOLES FOR 7/8" B X 1 1/2" H.S. BOLTS  
2W 32X3" SLOTS (TYP.)

TERMINAL CONNECTOR

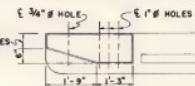


SECTION A-A

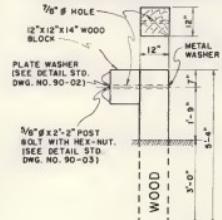
PLATE WASHER



6"X14"X3"-0" METAL BOX



ANCHOR POST DETAIL  
(SEE ROAD PLANS FOR DETAILS)



12"X12" WOOD POST

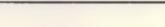
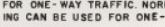
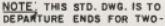
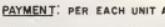
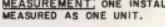
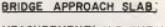
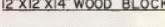
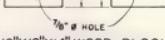


TABLE "A"

	RAIL	TYPE-1	TYPE-2	TYPE-3
2-LANE TREATMENT	CONTINUOUS RAIL	MATCH CONTINUOUS RAIL	MATCH CONTINUOUS RAIL	STD. DWG. NO. 90-06 TERMINAL 4
	NON- CONTINUOUS SLODR-RAIL	STD. DWG. NO. 90-06 TERMINAL 5	STD. DWG. NO. 90-06 TERMINAL 5	STD. DWG. NO. 90-06 TERMINAL 3
4-LANE TREATMENT	CONTINUOUS MEDIAN RAIL	MATCH CONTINUOUS RAIL	MATCH CONTINUOUS RAIL	STD. DWG. NO. 90-06 TERMINAL 4
	NON- CONTINUOUS MEDIAN RAIL	STD. DWG. NO. 90-06 TERMINAL 5	STD. DWG. NO. 90-06 TERMINAL 5	STD. DWG. NO. 90-06 TERMINAL 5

BRIDGE APPROACH SLAB: SEE STD. DWG. NO. 39-14 AND NO. 39-15.

MEASUREMENT: ONE INSTALLATION COMPLETE AS DETAILED TO BE MEASURED AS ONE UNIT.

PAYMENT: PER EACH UNIT AS CONTAINED IN BID PROPOSAL.

NOTE: THIS STD. DWG. IS TO BE USED FOR BRIDGE APPROACH AND/OR DEPARTURE ENDS FOR TWO-WAY TRAFFIC AND FOR APPROACH ENDS FOR ONE-WAY TRAFFIC. NORMAL B'X" POSTS AND 6'-3" POST SPACING CAN BE USED FOR ONE-WAY DEPARTURE ENDS.

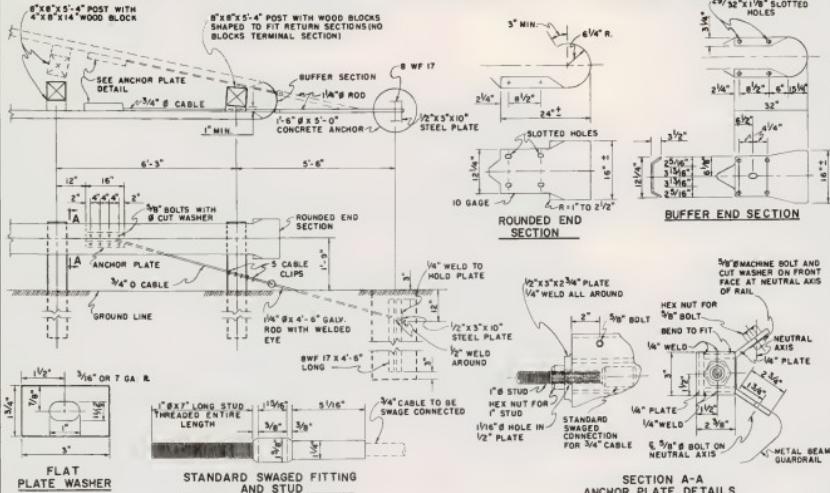


REVISED 11-1-70  
EFFECTIVE 1-1-71STATE HIGHWAY COMMISSION  
HELENA, MONTANAGUARDRAIL TERMINAL SECTIONS  
SHEET - 1

STANDARD DRAWING NO. 90-05

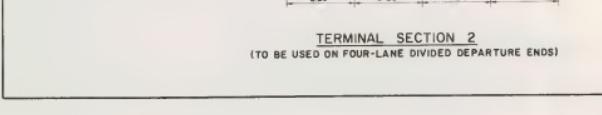
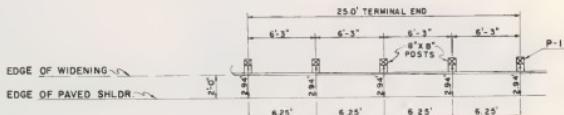
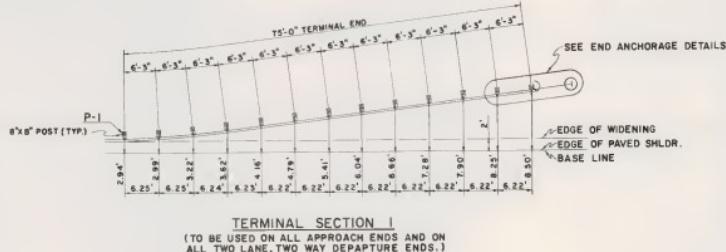
APPROVED

STATE HIGHWAY ENGINEER



NOTE: NO MEASUREMENT OR PAYMENT WILL BE MADE FOR THE END ANCHORS, ROUNDED END SECTIONS, AND BUFFER END SECTIONS, AS THE COST THEREOF SHALL BE ABSORBED IN THE UNIT BID PRICE FOR THE RAIL.

NOTE: CABLE SHALL BE 3/4" # CLASS A 25,000\*  
ROPE-AASHO M-30.

END ANCHORAGE DETAILS  
(TO BE USED ON ALL TERMINAL SECTIONS)



REVISED 11-1-70  
EFFECTIVE 1-1-71

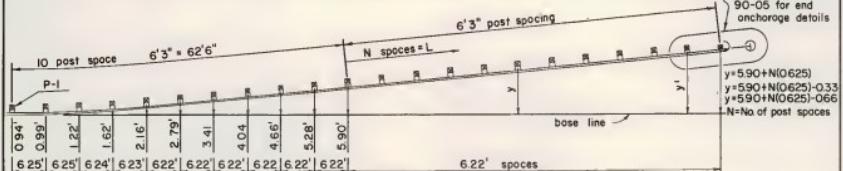
**STANDARD DRAWING NO. 90-06**

STATE HIGHWAY COMMISSION  
HELENA, MONTANA

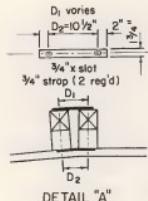
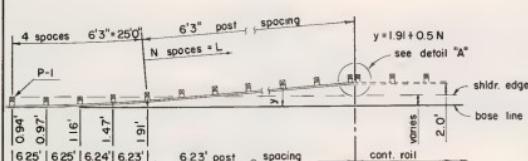
**GUARDRAIL TERMINAL SECTIONS  
SHEET-2**

APPROVED

*M. J. Bell*  
STATE HIGHWAY ENGINEER



## TERMINAL SECTION 3

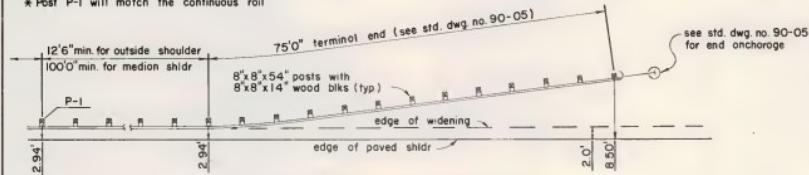


**TERMINAL SECTION 4**

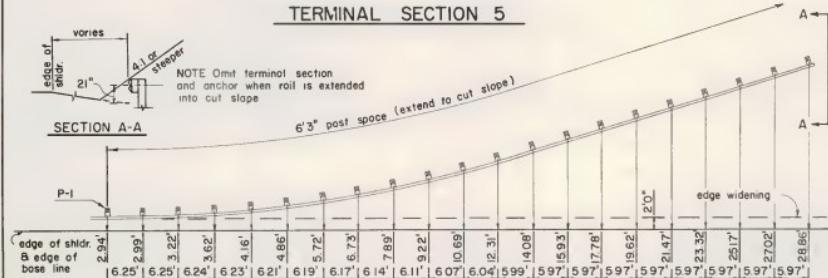
TABLE "B"

BRIDGE WIDTH (FT)	28'				30'				32'				34'				36'				38'				40' 44'																			
ROADWAY WIDTH (FT)	24	26	28	30	34	36	38	40	44	26	28	30	34	36	38	40	44	28	30	34	36	38	40	44	30	34	36	38	40	44	36	38	40	44	38	40	44	40	44					
TERMINAL 3 (N spaces)	6	8	10	12	14	16	18	20	22	6	8	10	12	14	16	18	20	6	8	10	12	14	16	18	6	8	10	12	14	16	8	10	12	14	16	18	10	12	14	16	8	12	8	
TERMINAL 4 (N spaces)	*	2	4	8	10	12	14	16	18	*	2	4	6	8	10	12	16	*	2	4	6	8	10	14	*	2	4	6	8	12	14	2	4	6	8	12	14	2	4	6	8	12	14	2

\* Post P-I will match the continuous rail



## TERMINAL SECTION 5



**TERMINAL SECTION 6**

(This Terminal Section to be used for cut slope embedment)



REVISED	11-1-70
EFFECTIVE	1-1-71

**STATE MINIMUM PRIMARIES**

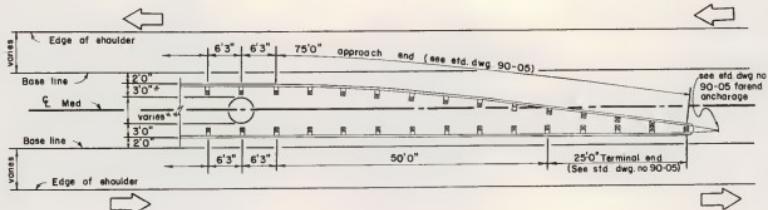
**STANDARD DRAWING NO. 90-07**

STATE HIGHWAY COMMISSION  
HELENA, MONTANA

## PIER TREATMENT

APPROVED

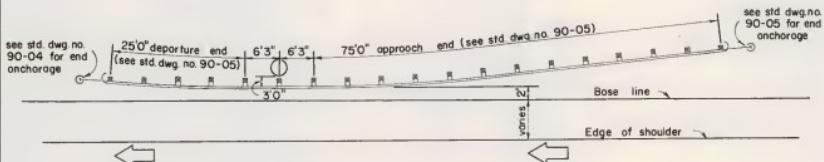
**STATE HIGHWAY ENGINEER**



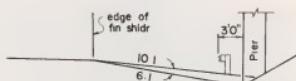
## MEDIAN BRIDGE PIER TREATMENT

\* This dimension may be greater if pier footings interfere with the guardrail post or if continuous roll is provided on the shoulder.

\*+When pier width is greater than 3'0", adjust the last eight post offsets of the 75' terminal section to fit the condition.

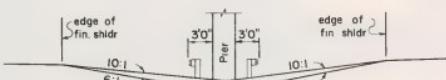


#### OUTSIDE SHLDR. BRIDGE PIER TREATMENT



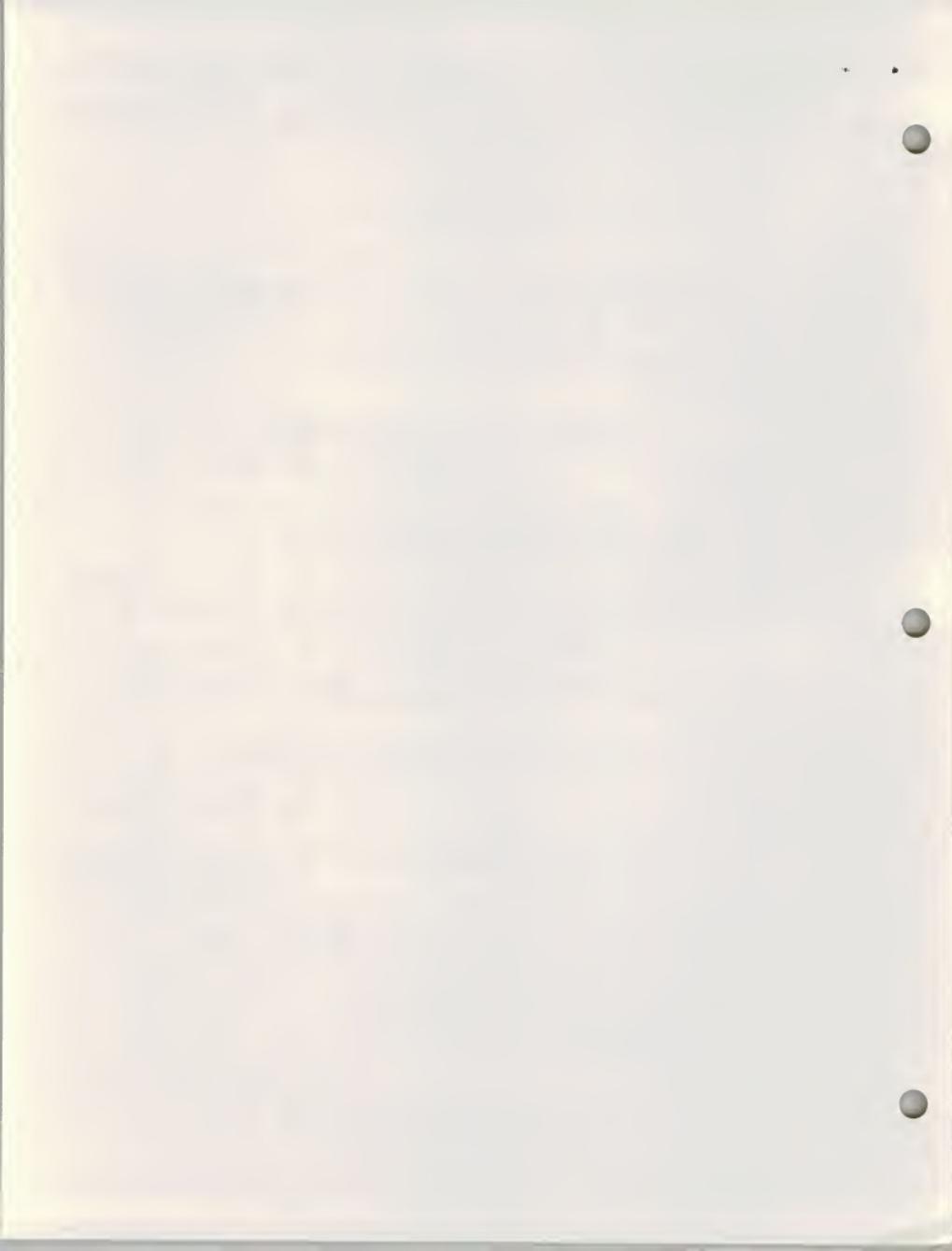
**OUTSIDE SHOULDER SLOPE**

NOTE Obstruction less than 30' from edge of nearest traffic lane require guardrail.



### MEDIAN SLOPE

NOTE: When guardrail installations are more than 2 feet from the edge of the shoulder, the fill slope shall be a 10:1 slope beginning at the edge of finished shoulder.



REVISED 11-1-70

EFFECTIVE 1-1-71

STANDARD DRAWING NO. 90-08

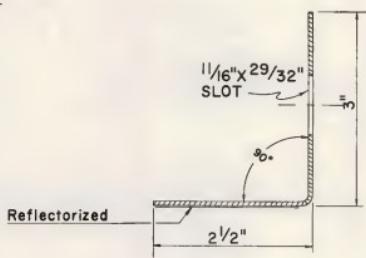
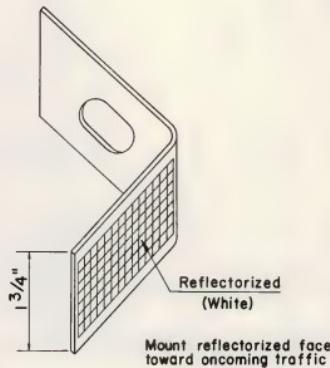
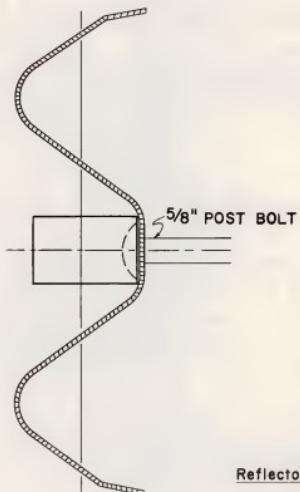
STATE HIGHWAY COMMISSION  
HELENA, MONTANA

## REFLECTOR-WASHER

APPROVED

Lester McMillen  
STATE HIGHWAY ENGINEER

Material- 8 gage galvanized  
approximate weight  
0.47 lbs.



All sections of guard rail shall have reflector-washers installed every 25 ft. Reflector-washers are not required on bridge end, bridge pier or grade crossing protection guard rail.

The use of reflectors will replace the need for the rectangular washers required to fasten rail to post.

Reflector-washers to be included in the unit price per linear foot of guard rail.



ENFORCED 1/1/67  
EFFECTIVE 9/1/68

11-1-70  
1-1-71

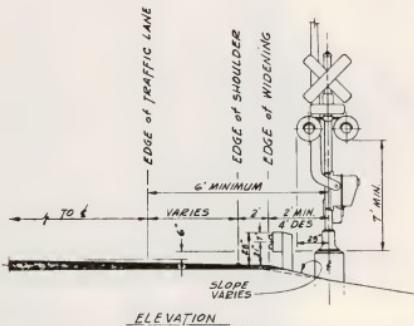
STANDARD DRAWING NO. 90-14

STATE HIGHWAY COMMISSION  
HELENA, MONTANA

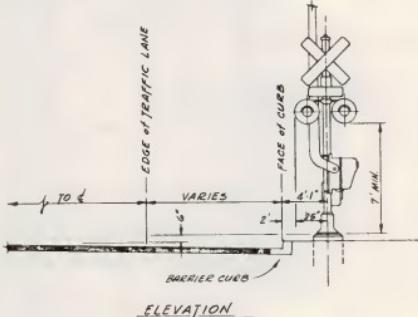
GUARDRAIL FOR  
GRADE CROSSING PROTECTION

APPROVED

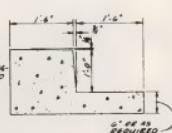
Lewis W. Bullock 7/18/67  
STATE HIGHWAY ENGINEER



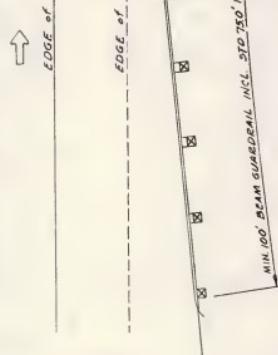
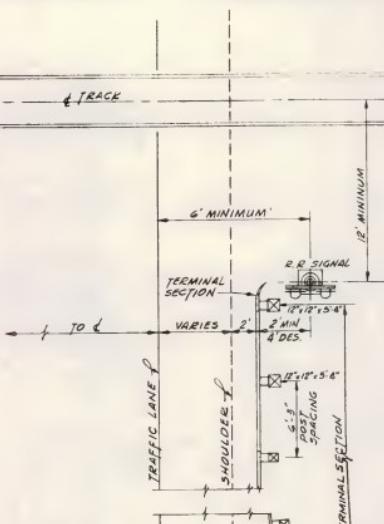
IN EVERY CASE WHERE THERE IS NO CURB, GUARDRAIL SHALL BE INSTALLED UNLESS SUCH INSTALLATION IS FOUND TO BE IMPRACTICAL.



USE SIMILAR  
DINEL REBAR  
MENT AS ON STD  
DWG 78-05



TYPICAL BARRIER CURB



NOTE -

SEE BULLETIN NO. 6 "RECOMMENDED PRACTICES  
FOR SAILED AND HIGHWAY GRADE CROSSING  
PROTECTION", ASSOCIATION OF AMERICAN  
RAILROADS, FOR ADDITIONAL DETAILS  
OF SKewed CROSSINGS.

SEE STD DWG 90-05 FOR TERMINAL SECTION  
DETAILS.



## CABLE GUARD RAIL

DRAWING NO. 90-20

\* The CABLE GUARD RAIL Drawing No. 90-06  
\* effective 1-1-69 remains unchanged except for  
\* the drawing number. Please change the number  
\* on this drawing to 90-20 and insert in your  
\* book in the proper sequence.

DRAWING NO. 90-21

\* The CABLE GUARD RAIL DRIVEWAY ANCHOR SECTION  
\* Drawing No. 90-07 effective 1-1-69 remains unchanged  
\* except for the drawing number. Please change the  
\* number on this drawing to 90-21 and insert in your  
\* book in the proper sequence.



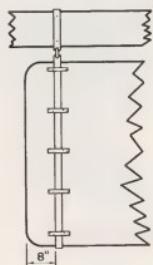
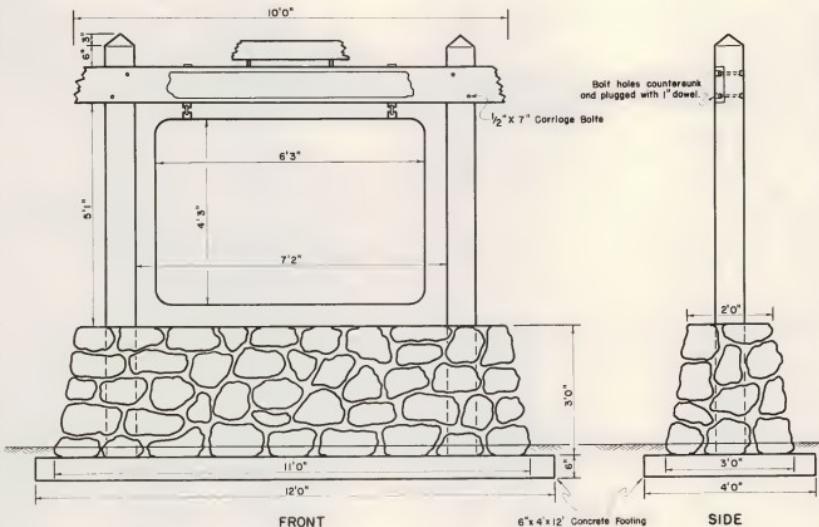
REVISED 11-16-70  
EFFECTIVE 7-1-69 1-1-71

STANDARD DRAWING NO. 100-13

State Highway Commission  
Helena, Montana

HISTORICAL MARKER

Approved  
*Frank M. Shellenbach*  
State Highway Engineer



Detail for attaching  
hanging irons to back of  
sign panel.

Sign panel  $5\frac{3}{4}$ " Redwood dowled and glued.  
Lettering routed and pointed white. Posts 8"X8"  
structure. Fir headpiece 3"X10" structure. Fir  
silhouette design routed in headpiece panel, posts  
and headpiece treated with Linseed Oil and wiped.

Base to be constructed of stone common to  
adjacent area.

